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OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

August 3, 1976

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

August 3, 1976 Volume 949 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of June 1976

Examiner affirmed	253
Examiner affirmed in part	55
Examiner reversed	105
Total	413

Public Search Room for Patents

Establishment of New Procedures and Revisions of Regulations

One of the major obligations of the Patent and Trademark Office is to make patent information available for public inspection. The quality of this service depends upon promoting an environment conducive to research and maintaining the integrity of the files in the Public Search Room for Patents.

To emphasize our commitment to providing this environment with complete and orderly files for public use, the Patent and Trademark Office is establishing new procedures and revising the Regulations for using the facilities of the Public Search Room for Patents. The new procedures and revised Regulations will become effective August 23, 1976. The new procedures for the Search Room include the requirement that users obtain and show, prior to entering the Search Room facilities, a User Pass. This pass can be obtained at a special desk near the guard station. User Passes will be issued to persons not under prohibition from using the search facilities who agree to abide by the Regulations of the Public Search Room for Patents by signing a statement to that effect. User Passes are non-transferable and are valid until reissue or revocation for cause.

The new procedures also include the requirement that persons entering and exiting the Search Room use designated lanes. Persons exiting the Search Room will automatically pass electronic sensing equipment designed to detect any marked documents or materials being removed from the Search Room. The sensing equipment is capable of detecting marked documents and materials in briefcases and parcels and under clothing. The equipment does not use X-ray or other high energy radiation and is, therefore, completely safe and harmless to persons, photographic film, magnetic tape and electronic or mechanical devices such as wristwatches. The Patent and Trademark Office is now preparing older documents in the Classified and Application files for use under this system. All new patents are marked for sensing before being placed in the Classified files.

Whenever a marked document is transported past the sensing equipment, Patent and Trademark Office officials and the security guards will be alerted to the removal of the document, and a gate on the exit lane will lock. Persons triggering the alarm will be asked to cooperate in identifying the source for the alarm. Failure to cooperate when the alarm is triggered could result in detention of the person, seizure of any briefcase or the like, or other legal measures deemed necessary and appropriate in the specific case.

In order to assure that the changes in the Search Room fully apply to the Record Room, the entrance to the Record Room will be relocated within the Search Room. This change is currently under way.

The revised Regulations for the Search Room appear below, and a reprinting of the Regulations brochure incorporating the revisions will soon be available in the Search Room. The substance of the changes in the procedures and the revised Regulations for the Search Room, as well as any pertinent information that will assist users in the changeover, will be prominently posted in the Search Room. In order to maintain an environment conducive to research, the revised Regulations will be strictly enforced.

Although these new procedures and revised Regulations may cause some inconvenience, it is hoped that with your understanding and cooperation they will result in improvement in search facilities which will benefit all participants in our patent system.

Regulations for the Public Use of Records in the Public Search Room for Patents of the Patent and Trademark Office

The Public Search Room for Patents is defined as that area comprising the foyers off the lobbies of Buildings 3 and 4 of Crystal Plaza; the offices, Microfilm Center, restrooms and telephone areas off these foyers; the stacks, Record Room, study and copier areas between the foyers; and the Mezzanine.

Under applicable statutes and regulations, including 49 U.S.C. 486(c); 41 CFR Subpart 101–20.3 and appropriate Sections of Department Organization Orders 30–3A and 30–3B of the Department of Commerce, the regulations appearing below are established for those using the facilities of the Public Search Room for Patents.

1. All persons using these facilities are subject to the regulations governing conduct on Federal Property, as specified in 41 CFR Subpart 101–20.3.
2. All posted Official Notices are to be complied with.
3. Smoking is not permitted except in designated areas.
4. Food and beverages in any form are not to be consumed except in designated areas.
5. Loud talking, use of radios, or any other form of activity which may disturb other members of the public is forbidden.
6. Children brought into the Public Search Room for Patents must not be allowed to disturb others.
7. Users of the facilities may not give the Patent and Trademark Office as a mailing address or otherwise suggest that mail may be received at the Patent and Trademark Office; nor may correspondence be conducted on official Patent and Trademark Office stationery.
8. Messages shall not be affixed to walls, desks, phone booths, or other public property, except designated message boards.
9. Patents and records shall not be removed from the facilities without proper authorization; nor shall they be mutilated. The unlawful removal or mutilation of records is forbidden by law and is punishable by fine or imprisonment or both (18 U.S.C. 2071).
10. The presence or use of equipment such as reproducing machines, typewriters and photographic equipment is prohibited without prior permission. The use of dictating equipment is prohibited, except in designated areas.
11. Library trucks or carts are to be used for transporting bundles only. They are not to be used for storage while making searches.
12. Patents temporarily removed from bundles for copying must be replaced promptly.
13. All bundles of patents must be promptly replaced in the stacks by the user.
14. The reserving of seats and/or working areas is prohibited.
15. Users of the Public Search Room for Patents are not permitted to use Patent and Trademark Office facilities beyond the Search Room after 5:00 p.m.
16. The front portion of the Public Search Room for Patents, i.e., that portion facing Crystal Plaza Drive and having a high ceiling, shall not be occupied by users after 6:00 p.m.
17. A valid User Pass must be shown upon request to authorized Patent and Trademark Office personnel.
18. User Passes are nontransferable and must be surrendered to authorized Patent and Trademark Office personnel upon request.
19. Packages, briefcases or other personal effects are subject to search by authorized Patent and Trademark Office personnel upon request.

20. All verbal requests for compliance with these regulations or other posted Patent and Trademark Office Notices pertaining to activity in the Public Search Room for Patents, when made by authorized Patent and Trademark Office personnel, must be promptly complied with.

Persons violating these regulations may be denied the use of the facilities in the Public Search Room for Patents, and may further be subjected to prosecution under the Criminal Code. Additionally, the name of any person violating these regulations who is registered to practice before the Patent and Trademark Office may be forwarded to the Solicitor for appropriate action under 37 CFR 1.348.

C. MARSHALL DANN,
July 9, 1976. *Commissioner of Patents and Trademarks.*

Examination of Claims for Patentability Under 35 U.S.C. 103

The purpose of this notice is to inform the public of the current Patent and Trademark Office policy concerning determinations of obviousness under 35 U.S.C. 103 in view of the recent Supreme Court decision in *Sakraida* v. *Ag Pro*, 189 USPQ 449 (1976).

The following text is a copy of a memorandum issued to all patent examining personnel relative to this topic.

"A clarification of the policy of the Patent and Trademark Office in the examination of claims for patentability under 35 U.S.C. 103 seems in order at this time in view of the Supreme Court's decision in *Sakraida* v. *Ag Pro*, 189 USPQ 449 (decided April 20, 1976) which is similar to the Court's earlier decision in *Anderson's-Black Rock, Inc.* v. *Pavement Salvage Co.*, 163 USPQ 673 (decided December 8, 1969).

"Office policy has consistently been to follow *Graham* v. *John Deere Co.*, 148 USPQ 459 (decided February 21, 1966) in the consideration and determination of obviousness under 35 U.S.C. 103. The three factual inquiries enunciated therein as a background for determining obviousness are as follows:

1. Determination of the scope and content of the prior art;
2. Ascertaining the differences between the prior art and the claims in issue; and
3. Resolving the level of ordinary skill in the pertinent art.

"Attention is directed to MPEP Section 706 for a more complete discussion of the application of the Graham test.

"The Supreme Court reaffirmed and relied upon the Graham three-pronged test in its consideration and determination of obviousness in the fact situations presented in both the Ag Pro and Black Rock decisions. In each case, the Court went on to discuss whether the claimed combinations produced a 'new or different function' and a 'synergistic result,' but clearly decided whether the claimed inventions were unobvious on the basis of the three-way test in Graham. Nowhere in its decisions in those cases does the Court state that the 'new or different function' and 'synergistic result' tests supersede a finding of unobviousness or obviousness under the Graham test.

"Accordingly, examiners should continue to apply the test for patentability under 35 U.S.C. 103 set forth in Graham. It should be noted that the Supreme Court's application of the Graham test to the fact circumstances in Ag Pro is somewhat stringent, as it was in Black Rock."

July 8, 1976.

C. MARSHALL DANN,
Commissioner of Patents & Trademarks.

TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

Chapter I—Patent and Trademark Office, Department of Commerce

PART 1—RULES OF PRACTICE IN PATENT CASES

Revision of Rules in Interference Practice

On February 19, 1976, notice of proposed rulemaking regarding the revision of §§ 1.228, 1.243, 1.244, 1.254, and 1.256 of Title 37, Code of Federal Regulations, was published in the Federal Register (41 FR 7513). Interested persons were asked to comment and a period extending from the date of publication of the proposed rule changes to March 26, 1976 was allocated for such purposes. Five comments were received. The comments and a summary of the comments are available for public inspection in Room 11E10 of Crystal Plaza Building 3, at 2021 Jefferson Davis Highway, Arlington, Virginia. All but one of the comments were favorable to the proposed changes. In view of the one adverse comment received, the proposal to amend § 1.254 is not being adopted. Section 1.228 was amended as proposed to provide a time for oral arguments at the hearing set under the provisions of said section and §§ 1.243 and 1.244 were rearranged without changing the wording therein. Finally, § 1.256 was amended to amplify the procedure therein.

In consideration of the comments received and pursuant to the authority contained in section 6 of the Act of July 19, 1952, as amended (85 Stat. 364; 35 U.S.C. 6), Part 1 of Title 37, Code of Federal Regulations is hereby amended as follows:

§ 1.228 *Summary Judgment.*

When an interference is declared on the basis of a showing under § 1.204(c), such showing will be examined by an Examiner of Interferences. If the Examiner considers that the facts set out in the showing provide sufficient basis for the interference to proceed, the interference will proceed in the normal manner as provided by the regulations in this part; otherwise an order shall be entered concurrently with the notice of interference pointing out wherein the showing is insufficient and notifying the applicant making such showing that summary judgment will be rendered against him because of such insufficiency at the expiration of a period specified in the notice, not less than 30 days, unless cause be shown why such action should not be taken. In the absence of a showing of good and sufficient cause, judgment shall be so rendered. Any response made during the specified period will be considered by a Board of Patent Interferences without an oral hearing unless such hearing is requested by the applicant, but additional affidavits, declarations or exhibits will not be considered unless accompanied by a showing in excuse of their omission from the original showing. If the applicant files a response to the order to show cause, the patentee will be furnished with one copy of the showing under § 1.204(c) and will be allowed not less than 30 days from its mailing date within which to present his views with respect thereto. He shall also be entitled to be represented at any oral hearing on the matter. Unless it shall be otherwise ordered before the hearing begins, oral arguments will be limited to not more than 30 minutes for each party. The Board will determine, on the basis of the original showing and the response made, whether the interference should be allowed to proceed or summary judgment should be entered against the junior applicant.

§ 1.243 *Motions before the Board of Patent Interferences*

(a) Motions relating to matters other than those specified in § 1.231 will be determined by a patent interference examiner or the Board of Patent Interferences, as may be deemed appropriate. Such motions shall be made in writing and shall contain a full statement of the action sought and the grounds therefor, and satisfactory proof of any facts required must accompany the motion. Oral hearings will not be held except on order of a patent interference examiner or Board of Patent Interferences. Briefs or memoranda in support of such motions shall accompany the motion. Any opposition to the motion, together with any brief or memorandum in support thereof, shall be filed within 20 days from the date of service of the motion unless some other date is set by the patent interferences examiner.

(b) Typewritten briefs may be used in connection with all motions. By stipulation of the parties subject to approval or by order of the tribunal before whom the motion is pending, briefs may be received if filed otherwise than as prescribed.

(c) In oral hearings on motions, the moving parties shall have the right to make the opening and closing arguments. Unless otherwise ordered before the hearing begins, oral arguments will be limited to 30 minutes for each party.

(d) Any request for reconsideration or modification of a decision or other action by the Board of Patent Interferences or patent interference examiner must be filed within 20 days

after the date of the decision or other action and any reply thereto must be filed within 20 days from the date of service of the request. With regard to requests for reconsideration of a decision after final hearing, see § 1.256(b).

§ 1.244 *Petition to the Commissioner from decisions on motions.*

There is no appeal from decisions rendered on motions, but the Commissioner may consider on petition any matter involving abuse of discretion or the exercise of his supervisory authority, or such other matters as he may deem proper to consider. Any such petition must comply with § 1.131 and, if not filed within 20 days from the decision complained of, may be dismissed as untimely. Any opposition thereto must be filed within 20 days from the date of service of the petition.

§ 1.254 *Briefs at final hearing.*

Briefs at final hearing before the Board of Patent Interferences shall be submitted in printed form, except that when not in excess of 50 legal-size double-spaced typewritten pages, or the equivalent thereof, and in any other case where satisfactory reason therefor is shown they may be submitted in type written form. If submitted in printed form, they shall be the same in size and the same as to page and print as is specified for printed copies of testimony. Typewritten briefs shall conform to the requirements for typewritten copies of testimony, except that legal-size paper may be used and the binding and covers specified are not required. Every brief of more than 15 pages shall contain a subject index with page references, supplemented by a list of all authorities referred to, together with references to pages thereof. Three copies of each brief must be filed. The times for filing briefs will be set at an appropriate stage in the proceeding prior to final hearing. The brief for the junior party shall present a full, fair statement of the questions involved, including his position with respect to priority evidence presented on behalf of other parties, and a clear statement of the points of law or fact on which he relies. The main brief for each party shall contain a copy of the counts in interference.

§ 1.256. *Final hearing.*

(a) Final hearings will be held by the Board of Patent Interferences on the day appointed at the designated time. If either party appears at the proper time, he will be heard. After the day of hearing, the case will not be taken up for oral argument except by consent of all parties. If the Board of Patent Interferences be prevented from hearing the case at the time specified, a new assignment will be made, or the case will be continued from day to day until heard. Unless it shall be otherwise ordered before the hearing begins, oral arguments will be limited to not more than one hour for each party. A junior party may reserve a portion of his time for rebuttal purposes, but a full, fair opening of his case must be made, including his position with respect to the case presented on behalf of other parties. After a contested case has been argued nothing further relating thereto will be heard unless upon request of the Board of Patent Interferences

(b) Any request for rehearing or reconsideration, or modification of the decision after final hearing, must be filed within 30 days from the date of the original decision, unless that decision is so modified as to become, in effect, a new decision, and the Board of Patent Interferences so states. Any reply thereto must be filed within 15 days from the filing of the request. The times specified herein may be extended by the Board of Patent Interferences upon a showing of sufficient cause. (See § 1.304).

Effective date: These amendments shall become effective on August 31, 1976.

Dated: June 23, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks

Approved:

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

[FR Doc. 76-19526; Filed 7-6-76; 8:45 am]

Patent Suits

Notices under 35 U.S.C. 290: Patent Act of 1952

3,542,321, R. D. Kahabka, TIE, **filed** Dec. 14, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c3161, *Panduit Corp.* v. *Minnesota Mining and Manufacturing Co.*

3,706,836, Frohlich, Cappel and Stubiger, WARP-KNIT FASTENER STRINGER; **3,762,002,** same, SLIDE-FASTENER STRINGER WITH KNIT TAPE, **filed** Nov. 25, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c4037, *Opti Beteiligungs- und Finanz-AG,* v. *YKK Zipper (U.S.A.) and Yoshida Kogyo K.K.*

3,721,968, G. E. Gee, MAGNETIC PICKUP, **filed** July 21, 1975, D.C. Pa. (Philadelphia), Doc. 75-2067, *Electro Corporation* v. *Transducer Systems, Inc.*

3,732,647, J. D. Stith, POLISHER-FINER MACHINE, **filed** Aug. 22, 1975, D.C., M.D. Fla. (Tampa), Doc. 75-608-C-T-K, *Coburn Optical Industries, Inc.* v. *Associated Development Corp.*

3,733,267, G. W. Haase, PROCESS OF FILTRATION OF DRY CLEANING FLUID, **filed** July 24, 1975, D.C., S.D. Calif. (San Diego), Doc. 75-0426-S, *Frederick Taussig* v. *Arthur Henschel, doing business as All Service Cleaners.*

3,756,008, G. F. Smith, SELF-COILING WIRE CABLE AND METHOD OF FORMING SAME, **filed** June 26, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV-75-2220-JWC, *Helistrand, Inc.* v. *Schwinn Bicycle Company, Schwinn Sales West, Inc.*

3,757,087, D. P. E. Barnard, HEATING ELEMENTS, **filed** Feb. 4, 1976, D.C.N.J. (Newark), Doc. 76-210, *Interdynamics, Inc. and Smiths Industries, Limited* v. *Kent Sales Co. and Julian Asch.*

3,762,002. (See 3,706,836.)

3,810,535, C. M. Phipps, GUMBALL MACHINE COIN BANK, **filed** May 14, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c1312, *Superior Toy & Manufacturing Co. Inc.* v. *Tarrison Company and Bruce Trafman and Martin Trafman, doing business as Todd Lynn Sales.* Filed plaintiff's notice of dismissal pursuant to Rule 41(a), case closed, June 14, 1974.

3,811,780, M. D. Liston, CHEMICAL ANALYSIS CUVETTE, **filed** Aug. 29, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c2911, *Abbott Laboratories* v. *Robert A. Stough & Company.*

3,850,087. Landblom and Mecklenburg. CREPE GRIDDLE FOR MAKING THIN UNIFORM CREPES, **filed** Mar. 9, 1976, D.C. Colo. (Denver), Doc. 76-W-269, *Creative Cookware, Inc.* v. *Northland Aluminum Products, Inc.*

3,885,717, R. F. Ewald, CHILD SAFETY CLOSURE FOR AEROSOL CONTAINERS, **filed** July 14, 1975, D.C.N.J. (Newark), Doc. 75-1216, *Seaquist Valve Company, Division of Pittway Corporation* v. *James J. Setter and Design Molded Products.* Consent order of dismissal of action, Feb. 25, 1976.

3,887,187, Crossman, Kenrick and LeMieux, AIR CUSHION TABLE GAME, **filed** June 3, 1975, D.C., S.D.N.Y., Doc. 75-C-2599, *Ideal Toy Corporation* v. *Brunswick Corporation.*

3,908,904, Kerner, Mahler and Peters, ULTRASONIC ATOMIZER FOR WASTE SULFURIC ACID AND USE THEREOF IN ACID CRACKING FURNACES, **filed** Oct. 14, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3442, *Penntube Plastics Co. and National Soda Straw Co.* v. *Union Carbide Corporation.* **Same, filed** Oct. 14, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3444, *Penntube Plastics Co. and National Soda Straw Co.* v. *Sweetheart Cup Co., Maryland Cup Corp. and Flex International.*

3,923,174, M. G. Straiger, NON-STOP REFUSE COLLECTION CONTAINER, **filed** Dec. 24, 1975, D.C. Ariz. (Phoenix), Doc. 75-876-Phx CAM, *Fiberglass Specialists, Inc.* v. *Marcel G. Straiger.*

3,929,049, C. L. Graversen, EXTENDED PITCH SAW CHAIN, **filed** Jan. 27, 1976, D.C. Oreg. (Portland), Doc. 76-87, *Omark Industries, Inc.* v. *Sabre Saw Chain (1963) Limited, Handyman Home Center, Inc. and G. I. Joes, Inc.*

Re. 26,492, Caveny and Moody, BINDER STRAP TOOL, **filed** Sept. 8, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c2210, *Panduit Corp.* v. *Burndy Corporation et al.* Pursuant to order of the United States Court of Appeals for the Seventh Circuit, plaintiff's complaint is ordered to be dismissed. On motion of plaintiff, order stay of execution of judgment until Sept. 18, 1975, Aug. 18, 1975.

Re. 26,667, E. G. Sarbo, FOOT COVER AND METHOD OF MANUFACTURING THE SAME, **filed** Mar. 12, 1976, D.C., E.D. Pa. (Philadelphia), Doc. 76-763, *Wayne-Gossard Corporation* v. *William G. Leininger Knitting Co.*

Re. 27,701, Allan, Jr. and Fink, FILTER FRAME SEAL, **filed** Aug. 13, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV-75-2716-F, *Hepa Corporation* v. *Flanders Filters.*

Re. 28,480, V. Petrusek, INFLATABLE BOXING GLOVE OR PILLOW, **filed** Nov. 3, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3715, *Centsable Products, Inc. et al.* v. *Spiegel of Illinois, Inc et al.*

D. 202,290, L. M. DeKarr, BOTTLE, **filed** June 20, 1975, D.C., C.D. Calif. (Los Angeles). Doc. CV-75-2088-IH, *Devlin Pharmaceuticals, Inc.* v. *Pharmavite Pharmaceutical Corp.*

D. 206,758, E. E. Radtke, SUPPORT MEMBER FOR A CUTTING BOARD OR THE LIKE, **filed** Jan. 29, 1975, D.C., S.D. Calif. (San Diego), Doc. 75-0056-T, *Terry Craft Enterprises, Inc.* v. *Physical Aids Manufacturing Company, a partnership composed of Donald E. Grote and James S. Picard and Simon Gaines, an individual.* Ordered, defendants are restrained and enjoined from the manufacture of an over the sink cutting board having wire support hangers, entered Mar. 10, 1975.

D. 217,949, S. Seskin, PAPER CHEF'S HAT, **filed** May 29, 1975, D.C. Fla. (Miami), Doc. 75-921-C-CA, *Samuel Seskin* v. *Superior Surgical Mfg. Co., Inc.*

D. 221,948. T. P. Centofanti, DENTAL FLOSS HOLDER, **filed** Feb. 11, 1975, D.C., E.D. Mich. (Detroit), Doc. 75-70260, *Thomas P. Centofanti* v. *Cunningham Drug Stores, Inc.*

D. 228,826, D. R. Cleminshaw, LOOSELEAF BINDER, **filed** Aug. 29, 1975, D.C., N.D. N.Y. (Utica), Doc. 75-CV-431, *Hall & McCheseney Inc.* v. *Paul E. Killion, Inc.*

D. 235,701, J. P. Famolare, Jr., SHOE SOLE, **filed** Aug. 13, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c2708, *Famolare, Inc.* v. *Edison Brothers Stores.*

PATENT NOTICES

Certificates of Correction for the Week of Aug. 3, 1976

te. 28,722	3,879,633	3,926,153	3,949,457
). 239,267	3,880,341	3,926,696	3,949,582
). 239,842	3,881,836	3,926,959	3,950,440
,464,932	3,881,974	3,926,968	3,950,635
,585,608	3,882,021	3,927,348	3,950,751
,629,189	3,882,835	3,927,673	3,950,859
,665,054	3,884,033	3,928,284	3,951,872
,672,866	3,884,799	3,928,368	3,952,371
,702,458	3,887,507	3,928,646	3,952,858
,762,778	3,888,292	3,929,269	3,953,465
,769,273	3,888,886	3,929,728	3,953,488
,786,612	3,891,393	3,930,147	3,953,645
,791,930	3,892,544	3,932,673	3,953,774
,793,346	3,893,839	3,932,884	3,953,813
,800,211	3,893,908	3,933,494	3,953,952
,801,634	3,894,901	3,934,210	3,954,097
,802,804	3,896,155	3,934,757	3,954,102
,813,393	3,897,417	3,934,900	3,954,420
,815,737	3,898,347	3,935,159	3,954,586
,816,457	3,899,514	3,936,739	3,954,587
,819,643	3,900,285	3,936,873	3,954,608
3,823,146	3,900,370	3,937,206	3,954,663
3,826,883	3,901,822	3,937,687	3,954,875
3,828,071	3,903,274	3,937,817	3,955,246
3,832,969	3,904,113	3,939,054	3,955,556
3,833,576	3,904,406	3,939,700	3,955,641
3,835,952	3,904,463	3,939,862	3,955,676
3,842,090	3,904,465	3,940,034	3,955,724
3,844,999	3,904,769	3,940,583	3,955,846
3,846,475	3,904,982	3,941,019	3,955,874
3,849,107	3,906,387	3,941,214	3,955,955
3,849,337	3,906,951	3,941,573	3,956,168
3,854,888	3,907,019	3,941,735	3,956,252
3,855,068	3,908,181	3,941,837	3,956,276
3,856,916	3,908,411	3,942,772	3,956,542
3,857,251	3,908,584	3,942,845	3,956,616
3,858,560	3,909,114	3,943,240	3,957,174
3,858,777	3,910,075	3,943,282	3,957,198
3,860,577	3,910,335	3,944,012	3,957,216
3,861,654	3,910,461	3,944,301	3,957,804
3,864,349	3,912,589	3,944,341	3,957,871
3,866,546	3,912,613	3,944,412	3,957,892
3,868,384	3,913,093	3,944,579	3,958,182
3,868,408	3,914,259	3,944,991	3,958,217
3,869,215	3,915,679	3,945,309	3,958,333
3,869,394	3,917,688	3,946,501	3,958,554
3,869,614	3,918,916	3,946,688	3,958,585
3,870,442	3,919,446	3,947,161	3,958,593
3,871,234	3,919,544	3,947,402	3,958,916
3,871,682	3,920,755	3,947,580	3,959,024
3,873,166	3,921,085	3,947,781	3,959,073
3,873,570	3,921,514	3,948,320	3,959,087
3,875,130	3,921,525	3,948,491	3,959,594
3,875,183	3,922,134	3,948,661	3,959,624
3,875,509	3,922,787	3,949,104	3,959,683
3,877,531	3,923,784	3,949,388	3,959,730
3,878,295	3,925,372	3,949,389	3,962,607
3,878,948	3,926,133	3,949,409	

Disclaimers

3,807,907.—*Edwin L. Gannaway,* Rockford, Ill. HERMETIC MOTOR-COMPRESSOR. Patent dated Apr. 30, 1974. Disclaimer filed June 14, 1976, by the assignee, *Copeland Corporation.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,880,849.—*Andre Szente* and *Joseph Hellerbach,* Basel, Switzerland. THIOPHENES. Patent dated Apr. 29, 1975. Disclaimer filed June 4, 1976, by the assignee, *Hoffmann-La Roche Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

3,898,492.—*Louis J. Vassos,* Park Ridge, *William P. Elser,* Harwood Heights, and *Alex F. Gascron,* Chicago, Ill. CURRENT INTERRUPTING BRUSH HOLDER ASSEMBLY. Patent dated Aug. 5, 1975. Disclaimer filed June 7, 1976, by the assignee, *Skil Corporation.*

Hereby enters this disclaimer to claims 1, 2 and 6 of said patent.

3,916,931.—*Edwin L. Shaw,* Oxnard, and *Everett H. Brewer,* Thousand Oaks, Calif. FLUID TRANSLATING DEVICE HAVING EXPANSIBLE CHAMBERS. Patent dated Nov. 4, 1975. Disclaimer filed June 14, 1976, by the assignee, *Abex Corporation.*

Hereby enters this disclaimer to claims 1 through 8, 11, 12, 15, 18 through 20, 22, 23, 25, 26, 28 and 29 of said patent.

3,929,868.—*John R. Dombroski* and *John R. Caldwell,* Kingsport, Tenn. SATURATED POLYESTER USEFUL AS LOW SHRINK ADDITIVE FOR MOLDING COMPOSITIONS CONTAINING UNSATURATED POLYESTERS. Patent dated Dec. 30, 1975. Disclaimer filed June 9, 1976, by the assignee, *Eastman Kodak Company.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,935,305.—*Thomas James Delaney,* Piscataway, and *William Grant Pierson,* Flanders, N.J. TOOTHPASTE. Patent dated Jan. 27, 1976. Disclaimer filed Feb. 17, 1976, by the assignee, *Colgate-Palmolive Company.*

The term of this patent subsequent to Jan. 27, 1993, has been disclaimed.

Dedication

3,822,563.—*Charles D. Orth,* Cedarburg, Wis. REFRIGERATION SYSTEM INCORPORATING TEMPERATURE RES RESPONSIVE WAX ELEMENT VALVE CONTROLLING EVAPORATOR OUTLET TEMPERATURE. Patent dated July 9, 1974. Dedication filed June 7, 1976, by the assignee, *The Singer Company.*

Hereby dedicates said patent to the Public.

Disclaimers and Dedications

3,524,876.—*James E. Gregson, Jr.,* Danville, Va. N,N-DIMETHYLOLCARBAMATES OF ETHER ALCOHOLS. Patent dated Aug. 18, 1970. Disclaimer and dedication filed June 14, 1976, by the assignee, *Dan River Inc.*

Hereby disclaims and dedicates to the Public all claims of said patent.

3,804,767.—*Terence Leslie Tombs,* Warwick, England. METHOD OF MANUFACTURING CERAMIC MAGNETS CONTAINING STRONTIUM OF BARIUM FERRITE. Patent dated Apr. 16, 1974. Disclaimer and dedication filed July 16, 1976, by the assignee, *Joseph Lucas (Industries) Limited.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

3,902,779.—*John C. Herbert,* Freeport, N.Y. ELECTRICAL CABLE CONNECTOR. Patent dated Sept. 2, 1975. Disclaimer and dedication filed June 15, 1976, by the assignee, *Herbert Products, Inc.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 30, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur: Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-2-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	10-1-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-17-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-17-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-21-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	11-3-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	9-19-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-2-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-6-73
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	4-14-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	9-24-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	2-3-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-15-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-25-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	12-8-75

Expiration of patents: The patents within the range of numbers indicated below expire during July 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,893,005 to 2,897,499 inclusive
Plant Patents..... Numbers 1,850 to 1,855 inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED AUGUST 3, 1976

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T949,001

PROCESS FOR IMPROVING THE DURABILITY OF WATER-DISPERSIBLE TEXTILE FINISHES

James G. Pacifici, Rte. 16, Heatherwood, Kingsport, Tenn. 37663

Filed Feb. 11, 1975, Ser. No. 549,106

Int. Cl.² B05D *3/10*
U.S. Cl. 427—341

No Drawing. 10 Pages Specification

This invention relates to a process for treating fabrics which contain textile finishes prepared from water dispersible polyester and polyesteramide compositions containing a monovalent metal cation to increase the durability of the finish. In particular, fabrics which have been coated with these finishes, coated and thermally crosslinked, or coated and radiation crosslinked are treated with an aqueous solution of a polyvalent metal cation such as Mn^{+2}, Zn^{+2}, Ba^{+2}, Al^{+3} and Ca^{+2}. This process increases the durability of the finish by making the finish less soluble in water.

T949,002

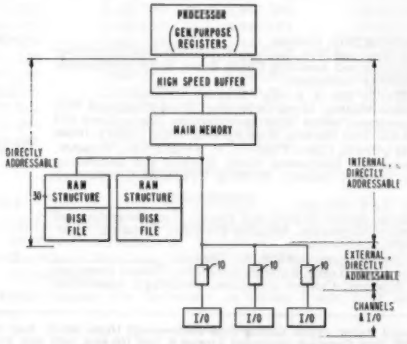
DISK FILE UPGRADING

Irving T. Ho and Jacob Riseman, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of application Ser. No. 451,642, Mar. 15, 1974, which is a continuation of abandoned application Ser. No. 268,353, July 3, 1972. This application July 25, 1975, Ser. No. 599,191

Int. Cl.² G06F *3/06, 13/06*
U.S. Cl. 340—172.5

3 Sheets Drawing. 21 Pages Specification



A low cost, low power and high density dynamic mode operation random access storage and its associated read/write, sensing, addressing and regenerating elements are combined with a sequential memory such as a disk file, to form a unitary hierarchial storage system. Complete with an associative memory and logic between the random access storage and the sequential memory, the combination will perform as if all the sequential storage may be addressed randomly.

T949,003

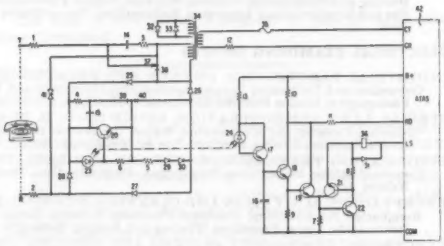
ELECTRICAL ISOLATION CIRCUIT FOR CONNECTING CUSTOMER EQUIPMENT TO THE TELEPHONE NETWORK

Harold Westly Earle, New Shrewsbury, and Joseph Robbins, Marlboro, N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed May 14, 1975, Ser. No. 577,288

Int. Cl.² H04Q *3/58*
U.S. Cl. 179—16 EA

1 Sheet Drawing. 8 Pages Specification



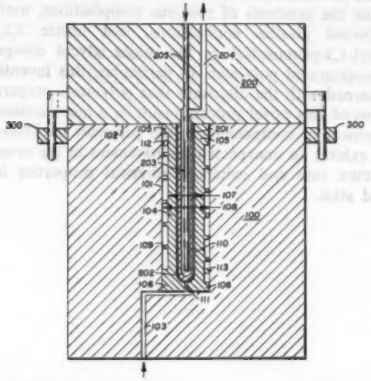
Protection of the telecommunications network and personnel from harm is afforded by a simplified guard circuit designed principally to interconnect automatic telephone answering devices with the network. The circuit features a two-way audio talking path and a separate incoming-only signaling path. Line seizure occurs in response to detection of ringing current, indicated to the customer device as a voltage reduction on a monitoring lead, and by the concurrent arming of a semiconductor switch in series with the customer power source and the guard circuit's line seizure relay. Line release is by the customer deenergizing the relay, either when the automatic answer cycle is completed or when there is an indication that the calling party has disconnected. Additional circuitry is included to prevent introducing hazardous voltage to the network from the customer's interface, to assure longitudinal line balance, to guard against excess signal level and to prevent origination of unauthorized network control signals such as line seizure and dialing. Other functions include proper on-hook and off-hook line termination, to prevent transmission in on-hook condition, preventing coupling longitudinal or metallic noise sources to the telephone line in the on-hook condition, and responding to ringing signals while rejecting dialing transients.

T949,004

METHOD AND APPARATUS FOR MOLDING POLY (ETHYLENE TEREPHTHALATE) PARISONS

Gerard V. Delaire, Rte. 1, Beverly, Apt. 9 37660, and Edward R. Hollander, Jr., Rte. 13, 213 Montezuma 37664, both of Kingsport, Tenn.

Filed May 14, 1975, Ser. No. 577,487
Int. Cl.² B29C *17/07;* B29F *1/00*
U.S. Cl. 264—328
1 Sheet Drawing. 8 Pages Specification



Disclosed is a method and apparatus for molding poly (ethylene terephthalate) parisons wherein helical flights are disposed within a cooling fluid annulus surrounding the parison mold causing the cooling fluid to be helically transported through the cooling fluid annulus.

T949,005

COATING SOLUTIONS

Charles H. Coney, 2008 Canterbury Road 37660, and Glenna E. Burnett, 1701 Dennis Bypass 37664, both of Kingsport, Tenn.

Continuation of application Ser. No. 459,242, Apr. 8, 1974, which is a continuation of application Ser. No. 333,243, Feb. 16, 1973, which in turn is a division of application Ser. No. 113,596, Feb. 8, 1971, all now abandoned. This application May 27, 1975, Ser. No. 580,639
Int. Cl.² B32B *21/06, 21/14, 29/00*
U.S. Cl. 428—535
No Drawing. 15 Pages Specification

A coating solution is disclosed which comprises cellulose propionate and a solvent therefor. The cellulose propionate contains, by weight, at least about 35% propionyl, between about 4.4% and about 12% hydroxyl, and no greater than about 4.5% acetyl, and has a viscosity of between about 0.02 to 20 seconds. The preferred solvent is a blend of lower alkanol and water. The solution is especially useful as a coating for paper, to render it glossy, scuff resistant, water resistant, and does not hinder its repulpability.

T949,006

OLEFINE POLYMERISATION PROCESS

James Frank Robert Jaggard, Bad Kissengen, Germany, and Ian Gabriel Williams, Letchworth, England, assignors to Imperial Chemical Industries, Limited, London, England

Filed Feb. 13, 1975, Ser. No. 549,750
Claims priority, application Great Britain, Feb. 18, 1974, 7,214/74
Int. Cl.² C08F *4/66, 10/06*
U.S. Cl. 260—88.2 R
No Drawing. 79 Pages Specification

An olefine, particularly propylene, is polymerized using a Ziegler catalyst including a transition metal compound which has been contacted with an organo-aluminum compound of the type R_2AlX where X is hydrocarbyl or halogen, a Lewis base and an olefine monomer, the proportions of organo-aluminum compound and Lewis base being in defined ranges and the contacting being effected for a time sufficient to polymerize up to 400 moles of the monomer for each mole of the transition metal compound.

A process is also described for the production of a component of an olefine polymerization catalyst including the steps of mixing together (1) a solid compound of a transition metal of Groups IVA to VIA of the Periodic Table; (2) from 0.05 up to 8 moles, for each mole of the solid compound of the transition metal, at least one compound of the formula: R_2AlX where R is hydrocarbyl and X is hydrocarbyl or halogen, such as diethyl aluminum chloride or aluminum triethyl and (3) from 0.05 up to 4 moles, for each mole of the solid compound of the transition metal, of at least one Lewis base compound, the number of moles of the Lewis base compound being less than the number of moles of the compound R_2AlX. Next, the mixture is contacted with at least one linear 1-olefine monomer having from 3 to 8 carbon atoms as set forth above.

The transition metal compound is preferably ball-milled with a Lewis base before being contacted with the organic-aluminum compound, Lewis base and olefine monomer.

T949,007

RUBBER RECLAIMING PROCESS AND PRODUCT

Grant Crane and Edward Leo Kay, Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of abandoned application Ser. No. 528,532, Nov. 29, 1974, which is a continuation of abandoned application Ser. No. 365,383, May 30, 1973. This application Sept. 10, 1975, Ser. No. 611,949.
Int. Cl.² C08J *11/04*
U.S. Cl. 260—2.3
No Drawing. 14 Pages Specification

Scrap vulcanized rubber is converted into a soluble reclaimed rubber by heating with a volatile aromatic hydrocarbon at 400° to 700° F. for 0.1 to 50 hours. From 2 to 900 parts by weight of rubber per 100 parts of the hydrocarbon are used, and substantially all of the aromatic hydrocarbon is removed, after treatment, by distillation. The soluble reclaim is incorporated into new elastomeric products.

T949,008

PROCESS OF RECLAIMING SCRAP VULCANIZED RUBBER, AND THE SOLUBLE RECLAIMED RUBBER THUS PRODUCED

Grant Crane and Edward Leo Kay, Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of abandoned application Ser. No. 528,515, Nov. 29, 1974, which is a continuation of abandoned application Ser. No. 365,382, May 30, 1973. This application Sept. 10, 1975, Ser. No. 611,950
Int. Cl.² C08J *11/04*
U.S. Cl. 260—2.3
No Drawing. 16 Pages Specification

From 2 to 150 parts by weight of vulcanized rubber scrap is added to 100 parts of a rubber processing oil, and the mixture is heated for 0.1 to 50 hours at 400° to 700° F. to produce a soluble reclaimed rubber. The product is incorporated into new rubber articles, such as tires.

T949,009

STABILIZATION OF ELASTOMERS AND THE ELASTOMERS THUS STABILIZED

John William Fieldhouse, Grant Crane, and Edward Leo Kay, Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of abandoned application Ser. No. 528,514, Nov. 29, 1974, which is a continuation of abandoned application Ser. No. 365,380, May 30, 1973. This application Sept. 11, 1975, Ser. No. 612,610
Int. Cl.[2] C08J *11/04*
U.S. Cl. 260—2.3
No Drawing. 17 Pages Specification

Elastomers, such as natural rubber, homopolymers of butadiene or isoprene, copolymers of butadiene and/or isoprene optionally with styrene or acrylonitrile, and terpolymers from ethylene, propylene and a diene monomer, are stabilized with from 0.5 to 25 parts by weight per 100 parts of elastomer of a solubilized reclaimed rubber. The solubilized reclaimed rubber is produced by treating scrap vulcanized rubber with a hydrocarbon solvent at 400° to 700° F. for from 0.1 to 50 hours.

T949,010

BLOCK-STRUCTURED UNSATURATED COPOLYESTER COMPOSITIONS

John R. Dombroski, Rte. 13, 5608 Cheyenne Trail, Kingsport, Tenn. 37664

Filed Sept. 22, 1975, Ser. No. 615,614
Int. Cl.[2] C08G *63/52*
U.S. Cl. 260—75 VA
No Drawing. 10 Pages Specification

This invention relates to an improved two-stage process for the synthesis of resinous compositions, useful in reinforced plastics applications, that utilize 2,2,4-trimethyl-1,3-pentanediol as the major glycol component the unsaturated polyester. In particular, this invention is concerned with the discovery that polyesters prepared by means of this novel process result in a more ordered arrangement of components in the polyester backbone and thus exhibit an unexpected improvement in the crosslinking cure rate and enhanced physical properties in the cured state.

REISSUE PATENTS

GRANTED AUGUST 3, 1976

ERRATA

For CLASS	See PATENT NO.
061–108	28,922

REISSUES

AUGUST 3, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,920

REMOTE CONTROL FOR VACUUM CLEANER MOTOR

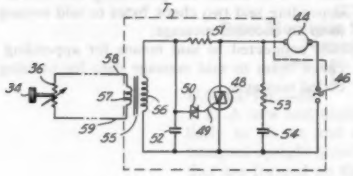
Östen Schwartz, Varmdo, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Original No. 3,855,665, dated Dec. 24, 1974, Ser. No. 315,438, Dec. 15, 1972. Application for reissue Mar. 5, 1975, Ser. No. 555,702

Claims priority, application Sweden, Dec. 28, 1971, 16748/71

Int. Cl.[2] A47L 9/00

U.S. Cl. 15—339 **2 Claims**



1. A remote control arrangement for a vacuum cleaner provided with a motor having an electrical energy source, a flexible hose, a cleaning appliance, a coupling means operatively connecting the flexible hose with the cleaning appliance, said coupling means also functioning as a hand grip comprising

a. an electrical circuit adapted to connect the source of electrical energy to the motor and including

1. a thyristor device provided with a phase shifting network controlling the power input to the motor,

2. a standard type transformer generating a conventional hysteresis curve in which the primary winding thereof is a first variable impedance that is a part of the phase shifting network,

3. a second variable impedance including the secondary winding of the transformer and a variable resistor located at a distance from the motor, an operating member for the variable resistor located on said hand grip, and a low voltage conduit positioned on said hose coupling the variable resistor to the secondary winding of the transformer,

4. the magnitude of the first variable impedance which affects the phase shifting network being dependent upon and changeable by the second variable impedance,

5. said phase shifting network including a capacitor coupled in parallel to the primary winding of said transformer whereby a desirable curve shape of said control pulses of said thyristor is produced.

Re. 28,921

VISUAL EXAMINATION APPARATUS

Richard F. Haines, Los Altos; James W. Fitzgerald, Atascadero, and Salvadore A. Rositano, San Jose, all of Calif., assignors to The United States of America as represented by the administrator of the National Aeronautics and Space Administration, Washington, D.C.

Original No. 3,737,214, dated June 5, 1973, Ser. No. 159,857, July 6, 1971. Application for reissue Mar. 19, 1974, Ser. No. 452,768

Int. Cl.[2] A61B 3/02, 3/06, 5/00

U.S. Cl. 351—23 **16 Claims**

1. Visual examination apparatus, comprising:

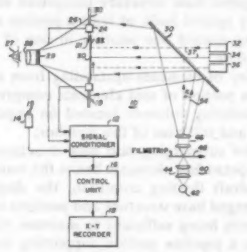
light receiving means including, a display screen for displaying visual stimuli to a patient, and photosensitive means [responsive to light and operative to generate binary coded decimal signals which control the meridian] *positioned to receive coded images for generating binary-coded decimal signals as a function of said images representative of the meridian* location, [and] direction of [the stimulous image] *movement and on-off status of the stimulus images;*

light projecting means for projecting stimulus images onto said signal display screen, and for projecting [control] *said coded* images commensurate with said stimulus images onto said photosensitive means;

said stimulus projecting means including means for sequentially projecting onto said display screen a continuously moving light image as an interrupted random trace in a pre-determined direction along a pre-determined meridian, said direction and meridian being automatically selected by means of a pre-set vision testing program and without active interaction with the patient being tested; [said light projecting means including means for projecting light through a flimstrip containing said stimulus images and said control images and onto said light receiving means;]

patient response means for developing response signals commensurate with said visual stimuli as perceived by said patient;

means responsive to said [*stimuli signals*] *binary-coded decimal signals* and said response signals and operative to develop recorder control signals; and



a recorder responsive to said recorder control signals and operative to provide a comparable record of said visual stimuli and the patient response corresponding thereto.

6. *Visual examination apparatus, comprising:*

means for displaying visual stimuli on a display screen to a patient;

said means for displaying visual stimuli including means for sequentially projecting onto said display screen a continuously moving interrupted random trace of a light image in a pre-determined direction along a pre-determined meridian, and means for automatically selecting the direction and meridian without interaction with the subject, said means including an already prepared vision testing program;

means for simultaneously generating electrical stimuli signals representative of the meridian location and directon of stimulus images;

patient response means for developing response signals commensurate with said visual stimuli as perceived by said patient;

means comprising electronic control circuitry responsive to said stimuli signals and said response signals and operative to develop concurrent recorder control signals therefor, and

a recorder responsive to said recorder signals including independent dual trace producing means and operative to

provide a comparable record of said visual stimuli and the patient response corresponding thereto.

Re. 28,922

COLUMN STABILIZED STINGER

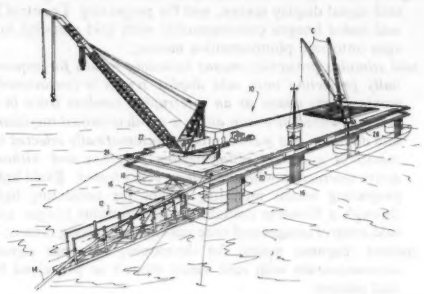
Samuel H. Lloyd, III, Los Angeles, Calif., assignor to Santa Fe International Corporation, Los Angeles, Calif.

Original No. 3,685,305, dated Aug. 22, 1972, Ser. No. 64,267, Aug. 17, 1970. Continuation-in-part of Ser. No. 22,634, March 25, 1970. Application for reissue Aug. 21, 1974, Ser. No. 499,431

Int. Cl.[2] B63B *35/04;* **F16L** *1/00*

U.S. Cl. 61—108 **57 Claims**

Filed Under Rule 47



1. A flotation member for laying pipeline on an underwater surface from a floating vessel having a pipeline work deck elevated above the mean waterline comprising:

an elongated base structure comprised of a pair of transversely spaced hulls, at least a portion of said hulls converging toward one another in one of the fore and aft directions;

a plurality of elements upstanding from said hulls with at least a portion of said elements comprised of a plurality of stabilizing columns located on opposite sides of the pitch and roll axes of the member;

means for submerging said base structure and portions of said upstanding elements below the waterline to obtain a high draft floating condition, the displacement of the submerged base structure and portions of said upstanding elements being sufficient to maintain the member buoyant in a pipeline portion supporting condition with the mean waterline located intermediate the height of said columns;

coupling means carried by said base structure adjacent its forward end for pivotally coupling the flotation member to the pipelaying vessel;

and means carried by said flotation member for supporting a portion of a pipeline for translational movement therealong, said pipeline support means being located above said base structure at elevations of decreasing height relative to said base structure in a forward to aft direction along said flotation member, the pipeline support means being adapted to receive pipeline payed out from the elevated work deck of the pipelaying vessel.

Re. 28,923

ERROR CORRECTION FOR TWO BYTES IN EACH CODE WORD IN A MULTI-CODE WORD SYSTEM

Arvind Motibhai Patel, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Original No. 3,745,528, dated July 10, 1973, Ser. No. 212,544, Dec. 27, 1971. Application for reissue June 13, 1975, Ser. No. 586,766

Int. Cl.[2] G06F *11/12*

U.S. Cl. 340—146.1 AL **13 Claims**

1. A system for correcting two tracks in error in a multi-track data arrangement, comprising:

means for providing message data Z_1, Z_2, Z_3,...Z_k arranged in blocks having k bytes arranged in a cross track direction, each byte having f bits of data where f-b×m where b and m are integers >1 and k is an integer $2<k<2^b$;

means connected to said means for providing message data for generating two check bytes from said message data in accordance with the equations:

$$C_1=Z_1 \oplus Z_2 \oplus Z_3 \ldots \oplus Z_k$$

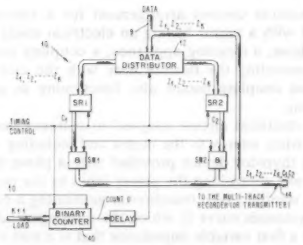
and

$$C_2=T^{\lambda} Z_1 \oplus T^{2\lambda} Z_2 \oplus \ldots \oplus T^{k\lambda} Z_k$$

where T is the companion matrix of a binary primitive polynomial g(x) of degree f and λ is any integer given by the expression $t([2^{fb}-1)/(2^b-1)$ in which t is any positive integer prime to 2^b-1;

means connected to said means for providing message data and to said means for generating two check bytes for appending said two check bytes to said message data to form an encoded message;

means connected to said means for appending said two check bytes to said message data for utilizing said encoded message;



means connected to said utilization means for decoding said encoded message denoted by Z_1', Z_2',...Z_k', C_1', C_2'; said decoding means including first and second shift registers for generating first and second syndromes S_1 and S_2 from said encoded message in accordance with the equations:

$$S_1=C_1' \oplus Z_1' \oplus Z_2' \oplus \ldots \oplus Z_k'$$

and

$$S_2=C_2' \oplus T^{\lambda} Z_1' \oplus T^{2\lambda} Z_2' \oplus \ldots \oplus T^{k\lambda} Z_k'$$

means for providing error track pointer signals as inputs to said decoder which identify the tracks in error;

error parameters signal generating means connected to said means for providing error track pointer signals for providing fixed signals in accordance with the tracks indicated to be in error;

means connected to said error track parameters signal generating means for generating control signals for the operation of said decoder; and

error correcting means connected to said first and second shift registers, to said means to for providing identifying *error pointer* signals, to said means for providing control signals, and to said utilization means for providing error correction of the erroneous bytes in any two indicated tracks in error.

PLANT PATENTS

GRANTED AUGUST 3, 1976

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,938

JUNIPER PLANT

Peter Mordigan, Sylmar, Calif., assignor to Select Nurseries, Inc., Brea, Calif.

Filed Apr. 7, 1975, Ser. No. 566,031
Int. Cl.[2] A01H *7/00*
U.S. Cl. Plt.—50 **1 Claim**

1. A new and distinct variety of juniper plant substantially as shown and described, characterized by its very compact upright growth, its thin needle-like juvenile leaves that are formed on the lower portion of each branch, the smaller adult leaves that are scale-like and appressed in groups, both juvenile and adult leaves being resinous in texture and having a tendency to curl downwardly at the tip portion, and by the absence of cones and seed.

PATENTS

GRANTED AUGUST 3, 1976

ERRATA

For CLASS	See PATENT NO.
056–010.2	3,972,156
051–206 R	3,972,161
052–069	3,972,162
052–082	3,972,163
052–095	3,972,164
052–309	3,972,165
052–404	3,972,166
052–481	3,972,167
052–698	3,972,168
052–702	3,972,169
052–750	3,972,170
082–005	3,972,250
082–014 R	3,972,251
083–549	3,972,260
123–122 AC	3,972,324
214–010.5 R	3,972,439
404–133	3,972,637
252–045	3,972,853
526–337	3,972,862
526–340	3,972,863
526–328	3,972,864
526–014	3,972,865
526–077	3,972,866
526–014	3,972,867
536–018	3,972,868
424–298	3,972,889
200–159 R	3,973,099
310–114	3,973,137
325–014	3,973,209
235–061.7 B	3,973,237
235–151.21	3,972,470

PATENTS

GRANTED AUGUST 3, 1926

ERRATA

PATENTS

GRANTED AUGUST 3, 1976

GENERAL AND MECHANICAL

3,972,075
HAIR STYLIST'S HAIRCUTTING HELMET
Constantino J. Alevras, 542 Gruman Court, Rivervale, N.J. 07675
Filed Apr. 21, 1975, Ser. No. 570,243
Int. Cl.² A42B *1/08*
U.S. Cl. 2—174 **4 Claims**

1. A hair stylist's haircutting helmet which comprises a head piece adaptable to and shaped to conform to and fit over the head and hair, said headpiece being further provided with a plurality of variously directed, uniformly spaced openings through which a suction force may be applied to said hair so that it is forceably drawn up and through the openings thereby freeing said hair for cutting and wherein said head piece further comprises a rounded top portion, a pair of opposing inwardly curved lateral sides, a front portion and a rear portion, said front portion being shorter than said rear portion, said rounded top being further provided with a plurality of horizontally oriented rectangular shaped openings, said lateral sides, front and rear portions being further provided with a plurality of vertically oriented circumferential spaced, rectangular shaped openings, and said rear portion being still further provided with a longitudinally oriented, elongated, rectangularly shaped slot all of through which openings said hair may be drawn.

3,972,076
MECHANISM FOR FLUSH SYSTEMS
Robert Joseph Ferdinand Martini, 28, rue Grimaldi, Monaco
Filed Mar. 17, 1975, Ser. No. 559,213
Claims priority, application France, Mar. 21, 1974, 74.09708; Feb. 3, 1975, 75.03233
Int. Cl.² E03D *1/22, 3/10*
U.S. Cl. 4—37 **10 Claims**

1. In a flushing mechanism for controlled draining of a water tank at atmospheric pressure, the improvement comprising:

a shutter valve including

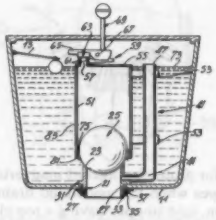
a resilient valve member freely floatable in the water of the tank, and

a seat for said valve member;

an air-containing bell disposed over said shutter valve, said bell having a lower open end and an upper closed end and dimensioned to permit free movement of said valve member within said bell and between said open and closed ends;

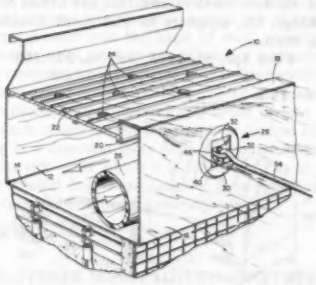
an upper valve on said upper closed end operable to selectively permit and prevent air to pass in and out of said bell; and

means providing a liquid seal between said seat and said resilient valve member when said upper valve is closed preventing air inside said bell to escape;



said valve, in its open position, permitting air inside said bell to escape, thereby allowing entry of water into said open end of said bell and causing said resilient valve to float upwardly releasing said resilient valve from said seat and consequently providing a draining of the tank through said shutter valve.

3,972,077
SWIMMING POOL ROPE ANCHOR
George R. Whitten, Jr., 11 Highland Ave., Bellingham, Mass. 02019
Filed May 27, 1975, Ser. No. 580,672
Int. Cl.² E04H *3/16, 3/18;* **F16L** *21/02*
U.S. Cl. 4—172 **7 Claims**

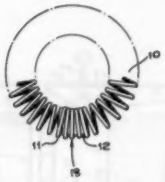


1. For use on a metal wall at the periphery of a swimming pool, a rope anchor comprising: an anchor body having a front flange surrounding an opening, and a back section forming a recess which is accessible through said front opening, said back section being adapted to protrude through a suitably dimensioned hole in said wall, with said front flange being in engagement with one side of said wall around said hole; an anchor link in said recess; and a removable pin adapted for insertion through oppositely disposed openings in said back section, said pin when thus inserted extending through said recess and said anchor link with the opposite ends of said pin being arranged to engage the other side of said wall thereby cooperating with said front flange to hold the rope anchor in place on said wall.

3,972,078
DRAIN SIEVE

George A. Maki, North Hollywood, Calif., assignor to George A. Maki, North Hollywood, Calif.

Filed Sept. 24, 1975, Ser. No. 616,324
Int. Cl.² A47K 1/14
U.S. Cl. 4—287 4 Claims



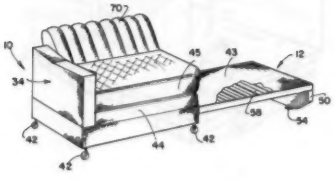
1. A device for protecting against inadvertent loss of objects down drain pipes when the associated drain stopper is in an opened position, said stopper having a top closure portion, an intermediate guide portion and a bottom actuated means for moving the top closure portion between opened and closed positions relative to a drain fitting having a flange surrounding a drain bore in which said intermediate guide portion travels, said device comprising in combination with a drain pipe,

screening means of toroidal configuration for mounting about said stopper adjacent and below said top closure portion to ride on said intermediate guide portion into said drain bore upon closure of said stopper and, out of said drain bore upon opening of said stopper, to fill a toroidal zone substantially between outer marginal underside areas of said top closure portion and an upper inner area of said drain fitting flange, whereby said drain bore is screened against the loss of objects therethrough when said stopper is in an opened position.

3,972,079
SEATING UNIT CONVERTIBLE TO A BED

Robert M. Shellow, North Miami, Fla., and Urban A. Weidner, Park Ridge, Ill., assignors to Mak-Kraft Creations, Inc., Kaleva, Mich.

Filed Apr. 30, 1975, Ser. No. 573,268
Int. Cl.² A47C 17/14, 13/00
U.S. Cl. 5—18 R 9 Claims

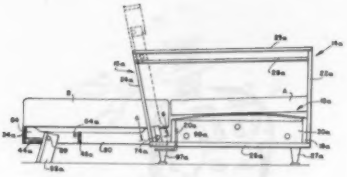


1. A seating unit convertible to a bed comprising, an outer seating section, with said outer seating section having means at its opposite ends for independently supporting said outer seating section on a floor surface, which outer seating section forms a slideable unit, an independent inner section positioned within the outer seating section and with said inner section having means at its opposite ends for independently supporting said inner section on a floor surface independently of said outer seating section, said inner section being spaced from said outer section when said outer section is positioned over said inner section so that sliding of said outer section longitudinally with respect to said inner section does not affect said stationary inner section, said inner section remaining stationary as said outer section is slid longitudinally of said inner section so that the outer seating section forms a continuation of said stationary inner section to convert said unit to a bed.

3,972,080
SOFA BED

Robert M. Shellow, North Miami, Fla., and Urban A. Weidner, Park Ridge, Ill., assignors to Mak-Kraft Creations, Inc., Kaleva, Mich.

Filed Apr. 24, 1975, Ser. No. 571,280
Int. Cl.² A47C 17/14
U.S. Cl. 5—38 8 Claims

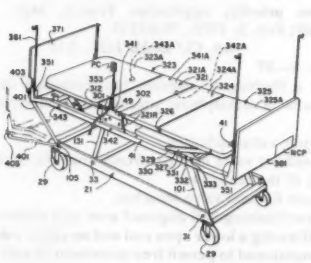


1. A sofa bed comprising, a seat section, a back section pivotally movable with respect to said seat section and pivotally movable from an upright position adjacent said seat section where it forms a sofa to a horizontal position adjacent said seat section to form a bed, said back section having a pair of longitudinally extending leg means pivotally secured thereto with said longitudinally extending leg means in out-of-the-way position when the back section is in an upright position, with said longitudinally extending leg means movable to a substantially upright position when said back section is in a horizontal position to support said back section in such horizontal position adjacent said seat section, each said longitudinally extending leg means extending from adjacent each of the opposite sides of said back section longitudinally inward a substantial portion of the length of said back section so that the pair of longitudinally extending leg means when in leg supporting position extend substantially at least one-half of the length of said back section.

3,972,081
BED ARRANGEMENT

Robert G. Stern, St. Louis, and Larry D. Mitchell, Ballwin, both of Mo., assignors to Affiliated Hospital Products, Inc., St. Louis, Mo.

Filed Aug. 20, 1973, Ser. No. 389,983
Int. Cl.² A61G 7/10
U.S. Cl. 5—68 36 Claims



1. A bed comprising

a support frame,

a seat section dual directionally pivotally mounted in opposite angular directions from a normal horizontal position on said support frame,

a further articulated support section pivotally connected to and independently carried directly by said pivotally mounted seat section, and being selectively independently pivotable relative to said pivotally mounted seat section,

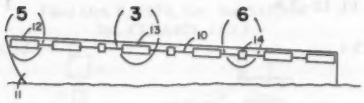
the pivotal connection of said further articulated support section being spaced from the pivotal mounting of said seat section on said support frame.

3,972,082

FLOATING COLLAR FOR BOATS

Robert C. Schwartz, 17621 Irvine Blvd., Suite 101, Tustin, Calif. 92680

Filed May 6, 1975, Ser. No. 574,951
Int. Cl.² B63C 9/00
U.S. Cl. 9—14 2 Claims



1. A nautical safety device carried on the top outside of a boat hull comprises:

a plurality of tension assemblies attached by suitable means to said boat hull;

wherein said tension assemblies each comprise:

a substantially U-shaped spring housing having a bottom, a first leg, and a second leg, each said leg having an aperture therethru substantially in line with each other, said aperture in said first leg being larger than said aperture in said second leg, said first leg having a second opening extending therethru;

a flat backup plate;

a spring follower enclosed in said spring housing having a flat main body, a first end configured in a hook, a second end bent substantially ninety degrees to said main body, said second end having an aperture therethru having the same diameter as said aperture in said first leg of said spring housing;

an elongate compression spring entrapped between said first leg of said spring housing and said second end of said spring follower;

a shoulder bolt, said shoulder bolt entering said aperture in said first leg of said spring housing, sliding thru the inside of said compression spring, passing thru said aperture in said second end of said spring follower where the shoulder portion is stopped by the smaller diameter of said aperture in said second leg of said spring housing but the threads pass thru and said bolt is locked by a nut;

a cover having a bottom, two sides and two open centered ends fitting in frictional engagement over the outside of said legs of said spring housing;

a buoyant collar assembly attached in biased suspension between two said tension assemblies;

a plurality of fairlead assemblies attached by suitable means to said boat hull and supporting said buoyant collar assembly; and

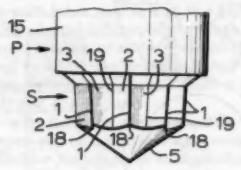
a pluality of semi-rigid bumpers, one said bumper enclosing each said tension assembly and each said fairlead assembly whereby said bumpers serve as fenders for said boat.

3,972,083

PUNCH FOR MAKING RECESSED SCREW

Geoffrey Dreger, Etobicoke, Canada, assignor to P.L. Robertson Manufacturing Co. Ltd., Canada

Division of Ser. No. 189,477, Oct. 31, 1971, abandoned, which is a continuation-in-part of Ser. No. 835,431, June 23, 1969, Pat. No. 3,604,305. This application Jan. 13, 1975, Ser. No. 540,630
Int. Cl.² B23G 9/00; B21K 1/46
U.S. Cl. 10—7 1 Claim



1. A punch for producing a tool engaging socket in the head of a threaded fastener by a single blow delivered at room temperature comprising an axially extending socket forming portion centered on and symmetrical relative to the longitudinal axis of said punch and presenting in cross section eight symmetrically disposed corners, each corner being defined by a pair of identical wall portions which intersect at a right angle, any series of four alternate corners and their defining wall portions outlining a square, the remaining series of four alternate corners and their defining wall portions outlining a second square in 45° angular relation to said first-mentioned square, each wall portion defining a part of an included angle of 135° with a wall portion defining a part of the next adjacent corner along an intersection equally spaced from such corners to provide a total of sixteen identical wall portions, each of said wall portions being inclined toward said axis of said fastener so that said punch tapers towards its terminal end, said intersections defined by said included angles being inclined to said axis of said fastener at an angle greater than the angle of inclination of said sidewall portions, and the lines of intersection at said corners being inclined to said axis of said fastener at an angle greater than the angle of inclination defined by said included angles, each corner of each of said series of four alternate corners providing an additional downwardly tapered wedge of material symmetrically centered on a side of said square outlined by the other of said series of four alternate corners, each of said downwardly tapered wedges of material extending in a direction away from the center of said punch beyond the side upon which it is centered so as to reinforce such side against breaking caused by side deflection forces, and said terminal end being generally conical.

3,972,084

FASTENER MANUFACTURING METHOD

Richard L. Reynolds, Palos Verdes, Canada, assignor to Litton Fastening Systems, Lakewood, Calif.

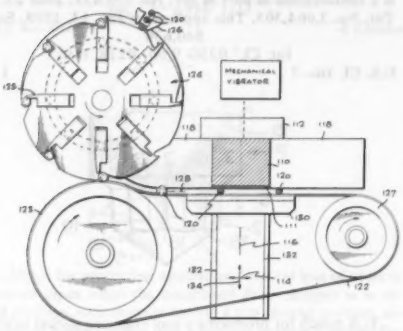
Continuation-in-part of Ser. No. 353,449, April 23, 1973, Pat. No. 3,894,570, which is a division of Ser. No. 479,650, June 17, 1974. This application Mar. 3, 1975, Ser. No. 554,734
Int. Cl.² B21H 3/02; B23G 9/00; B23K 9/04
U.S. Cl. 10—10 R 8 Claims

1. A method of manufacturing an impregnated, threaded fastener comprising the steps:

a. mechanically feeding at least one thread crest of a threaded fastener along a fastener path into contact with an electrode having an impregnable substance,

b. mounting said electrode on a swivel mounted block where said block swivels in one plane in both clockwise and counterclockwise directions about a point generally defined by the intersection of the fastener path and a vibrational axis of said electrode,

c. rapidly, mechanically vibrating said electrode along the vibrational axis into and out of contact with said thread crest as said threaded fastener is mechanically fed along said fastener path adjacent said electrode, and



d applying an electrical potential at a substantially low value to said electrode relative to said threaded fastener so that at least a portion of said thread crest is impregnated with said impregnable substance.

3,972,085

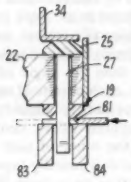
CUT-OFF DEVICE FOR BINDING MACHINE

Joe D. Giulie, Palo Alto, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 511,172, Oct. 2, 1974, abandoned. This application June 2, 1975, Ser. No. 582,812

Int. Cl.² B42C *19/00;* **B26D** *5/08, 1/00*

U.S. Cl. 11—1 MB **6 Claims**



1. In a machine adapted to press together first and second binding elements to bind a stack of sheet material having spaced openings along one edge, the first binding element having a plurality of projecting studs adapted to project through the openings in the stack and the second binding element having a plurality of spaced holes adapted to receive the studs, said maching comprising a plurality of spaced fingers having support surfaces adapted for supporting a said second binding element, means adapted for pressing a said first binding element toward a said second binding element supported on said fingers to compress a said stack of sheet material therebetween and push the studs through the mating holes in the second binding element, and means adapted for cutting of the end portions of the studs extending through the holes past a said second binding element, the improvement wherein said means adapted for cutting comprises:

a plurality of generally U-shaped members each having spaced arms with corresponding side surfaces of said arms defining a planar surface and having a sharp edge at the bight portion thereof, each of said U-shaped members being adapted to be positioned with its arms along opposite sides of one of the holes of a said second binding element and with said planar surface contacting the second binding element;

means for mounting said U-shaped members in spaced alignment for movement from (1) a first position adapted so that the surfaces on the arms can at least partially support a said second binding element and permit the studs of a said first binding element to pass through the second binding element and between the spaced arms of said U-shaped members when the binding elements are compressed by said means for compressing, (2) toward a second position adapted so that the edges of said U-shaped members will cut off the ends of the studs projecting past the second binding element; and

means for moving the U-shaped members from said first to said second position.

3,972,086

MACHINE FOR ASSEMBLING SHOE UPPERS DIRECTLY ON ASSEMBLY FORMS

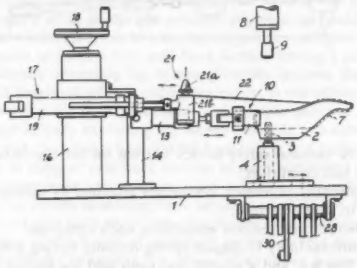
Luciano Belli, P.za Trento Trieste, 1, Busto Arisizio, Varese, and Ezio Toja, Via Bellingera, 2, Legnano, Milan, both of Italy

Filed Feb. 24, 1975, Ser. No. 552,002

Claims priority, application Austria, June 21, 1974, 24286/74

Int. Cl.² A43D *15/00, 21/00*

U.S. Cl. 12—7.9 **2 Claims**



1. Machine for assembling uppers directly on assembly forms, comprising: means for removably blocking at least a form against translation and rotation, means for holding an upper and an insole externally covered with glue on said form, said upper being predisposed for string lasting assemblage with a string projecting therefrom, grasping members for removably engaging the string projecting from said upper and controllably movable in a direction appropriate for pulling said string in order to have the tip and the heel of said upper adhere to the glue of said insole placed on the form, and elements for pressing the shanks of the upper so as to cause them to adhere to said insole, wherein said means for holding an upper and an insole on said form consists of adjustable and pneumatically movable blocking elements.

3,972,087

PROCESS FOR CONNECTING A SHOE SOLE TO ITS SHAFT

Ferdinand Haizinger, Koflach, Austria, assignor to Koflach Sportgerate Ges. m.b.H., Vienna, Austria

Filed Feb. 25, 1975, Ser. No. 552,746

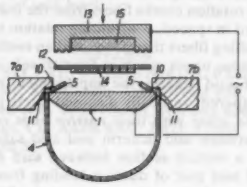
Claims priority, application Austria, Feb. 27, 1974, 1618/74

Int. Cl.² A43D *21/00, 3/00*

U.S. Cl. 12—145 **2 Claims**

1. Process for connecting the sole of a shoe with its shaft, noting that said sole and said shaft consist at least partially of thermoplastic synthetic resin, characterized in that the shaft is being put over a mold corresponding in its shape to the shape of the sole, noting that an edge of the shaft is allowed to protrude over said mold and that the shaft is being expanded

in longitudinal direction of the mold, and in that subsequently the protruding edge of the shaft is being bent over said mold



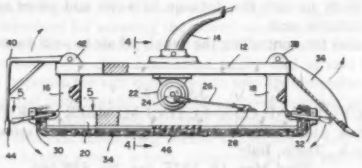
and that finally the sole is being pressed against the mold and is being welded with said bent edge by means of radio frequency.

3,972,088

ELECTRIC FLOOR SCRUBBER

Clarence Thomas, 403 W. 21st St. Apt. 4-W, New York, N.Y. 10011

Filed Oct. 8, 1974, Ser. No. 513,096
Int. Cl.² A47L *11/12*
U.S. Cl. 15—4 **1 Claim**



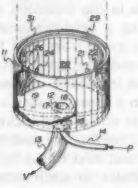
1. An electric floor scrubber comprising a stationary plate, an oscillator plate, flexible spacers connecting said plates, a cleaning pad attached to the underside of said oscillator plate, a pivotal clamp at each end of the scrubber for clamping said pad in position, a motor and shaft depending from said stationary plate, a crank arm connected at right angles to and eccentrically of said shaft and universally connected to said oscillator plate, the latter being thereby oscillated linearly, and a scraper pivotally mounted on the stationary plate and adapted to be engaged and linearly vibrated by one of said clamps due to the periodic movement of said oscillator plate.

3,972,089

BRAKE DRUM DUSTER SYSTEM

Calvin G. Parks, 3043 Idlewild Way, San Diego, Calif. 92117

Continuation-in-part of Ser. No. 355,541, April 30, 1973, abandoned. This application Nov. 6, 1974, Ser. No. 521,181
Int. Cl.² A47L *5/14*
U.S. Cl. 15—345 **2 Claims**



1. A brake drum and shoe assembly duster system comprising:

a cylindrical container having one open end and one closed end, said open end being dimensioned for loosely receiving a brake drum and brake shoe assembly;

an annular shoulder coupled to the inner surface of said container in proximity to said open end and dimensioned and operable for limiting the travel of said brake drum and brake shoe assembly within said container;

a vacuum fitting coupled to an aperture centrally disposed in said closed end;

at least two high pressure air nozzles disposed on the inside of said drum around said aperture and diametrically opposed to each other, said at least two high pressure air nozzles being adapted for coupling to a high pressure line, whereby upon rotation of said cylindrical container 180° with respect to said brake drum and shoe assembly the entire inside surface of said brake drum is exposed to at least one of said nozzles; and

at least one reduction ring dimensioned for cooperation with said open end of said cylindrical container and said annular shoulder for adaption to a smaller sized brake drum and brake shoe assembly, said adapter ring having an annular shoulder coupled to an inner surface thereof dimensioned for and operable for limiting the travel of said brake drum and said brake shoe assembly within said adapter ring, said reduction ring being removably coupled to said open end of said cylindrical container; and

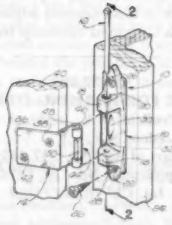
the annular shoulder coupled to the inner surface of said container.

3,972,090

SELF-LATCHING HINGE

Frank A. Holmes, Ventura, Calif., assignor to Jaybee Manufacturing Corporation, Los Angeles, Calif.

Filed June 19, 1975, Ser. No. 588,217
Int. Cl.² E05D *11/10*
U.S. Cl. 16—139 **10 Claims**



1. A self-latching hinge comprising:

a pair of hinge members pivotally connected by a hinge pin;

one hinge member having a hinge knuckle which incompletely encircles said pin to define a bearing sleeve, said bearing sleeve having an exterior cam surface;

the other hinge member being formed of a resilient material and including a spaced pair of hinge pin receiving knuckles separated by a base portion having a boss extending toward said hinge pin to engage said bearing sleeve cam surface when said hinge is closed, said bearing sleeve and said boss being compressed against each other when said hinge is closed, the resilience of said boss thereby acting to releasably maintain said hinge closed;

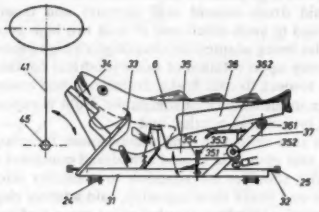
said knuckles, said base portion and said boss of said resilient hinge member forming a one-piece integral structure.

3,972,091

DEVICE FOR SEVERING THE HEADS OF FISHES

Franz Dohrendorf, Lubeck, Germany, assignor to Nordischer Maschinenbau Rud. Baader, Lubeck, Germany

Division of Ser. No. 241,512, April 6, 1972, Pat. No. 3,885,270. This application Feb. 24, 1975, Ser. No. 552,637
Int. Cl.[2] A22C *25/00*
U.S. Cl. 17—55 6 Claims



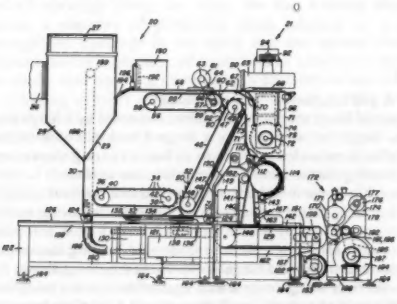
1. A device for processing the heads of gutted fish comprising an intermittently advanced endless conveyor including receiving means for retaining the fish belly-side-down with their length disposed perpendicularly to the path of travel of said conveyor, a head severing device comprising a pair of circular knives arranged angularly to each other and having at one side closely-spaced, adjacent cutting edges located in the plane of symmetry of said receiving means, and means for moving said knives transversely relative to the path of movement of said fish, a separating device for separating the collar bones from the head of the fish, said separating device comprising a pair of circular knives cooperating with each other and having adjacent cutting edges, said separating device being positioned downstream of said head separating device and spaced therefrom by a distance approximately equal to the spacing between adjacent receiving means, means mounting said separating device for pivotal movement through the path of movement of said receiving means, each receiving means comprising a support engaging the gill cavity of the fish supported thereon and including a pair of supporting edges arranged in V-shape, a head support adjacent said support, a belly support, and a U-shaped open-top trough.

3,972,092

MACHINE FOR FORMING FIBER WEBS

Dennis E. Wood, Penfield, N.Y., assignor to Rando Machine Corporation, Macedon, N.Y.

Continuation-in-part of Ser. No. 337,019, March 1, 1973, abandoned. This application Nov. 26, 1974, Ser. No. 527,379
Int. Cl.[2] D01G *25/00*
U.S. Cl. 19—156.3 8 Claims



1. In a machine for forming random fiber webs, having a first rotary foraminate condenser, means for delivering airborne fibers onto said first condenser to form a fiber mat on said first condenser, a rotary lickerin mounted beneath said first condenser, means for doffing the mat from said first condenser and feeding the mat to the lickerin so that the lickerin in its rotation combs fibers from the mat, a cylindrical saber mounted in spaced, confronting relation to said lickerin to assist in doffing fibers therefrom, and an endless foraminate condenser whose upper reach at least travels in a horizontal plane beneath said lickerin, the improvement comprising

a pair of tapered, vertically disposed ducts positioned one above the other with their narrow ends opening on the space between said lickerin and said saber, said space forming a venturi section between said ducts, and the lower of said pair of ducts extending from said venturi section to and above the upper reach of the last-named condenser,

pneumatic means for creating a high velocity air stream in said lower duct to doff fibers from said lickerin and to convey the doffed fibers in a vertically downward direction onto the upper reach of said last-named condenser,

said pneumatic means including means for recirculating said air stream downwardly through the upper of said ducts and tangentially past said lickerin and into the upper end of said lower duct, after the stream has passed through the upper reach of said last-named condenser, and

means for controlling the air flow in said ducts to minimize turbulence in said lower duct, including means eccentrically mounting said saber for rotational adjustment selectively to vary the distance between said saber and said lickerin, and

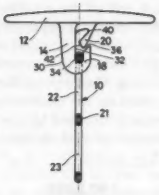
means for controlling the supply of air to said ducts.

3,972,093

BUTTON AND CONNECTING MEMBER ASSEMBLY

Michele Aimar, Turin, Italy, assignor to ITW Fastex Italia, S.p.A., Turin, Italy

Filed Mar. 18, 1975, Ser. No. 559,606
Claims priority, application Italy, Mar. 28, 1974, 49812/74
Int. Cl.[2] A44B *1/18, 13/00*
U.S. Cl. 24—90 B 4 Claims



1. A one-piece button for cooperative engagement with fastening means in upholstery work, said button including a head and a tapered substantially rigid stem projecting from said head and terminating in a reversely bent hook means extending back toward said head to provide a bight portion facing said head, said hook portion terminating in a beveled surface which slants in the direction of said bight portion, a locking finger having a predetermined resilient hinge point extending angularly away from said head toward said bight and having its free end positioned below the upper extremity of said hook portion in spaced opposed relation to said beveled surface to form a throat having a limited predetermined opening size, the free end of said locking finger being beveled toward said beveled surface of said hook, said beveled surfaces of said hook and said finger lying in planes which are generally perpendicular to each other, said locking finger having means to limit the opening size of said throat, whereby introduction of said cooperative fastening means into said throat results in movement of said finger in one direction about said hinge point to increase said throat size for accep-

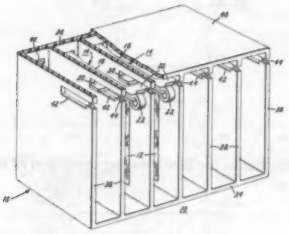
tance of fastening means into said bight while movement of fastening means in the opposite direction will close said throat by contact of the fastening means with the beveled free end of said finger and its resultant movement into contact with said beveled surface of said hook.

3,972,094

DEVICE FOR SECURING AND STORING PAIRED SOCKS

Kenneth J. Fuller, 813 Ceader Ave., Drexel Hill, Pa. 19026

Filed Apr. 7, 1975, Ser. No. 565,836
Int. Cl.² A44B 9/00; B42F 17/00
U.S. Cl. 24—150 SP 4 Claims



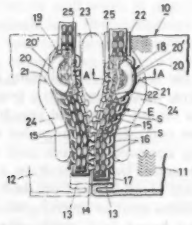
1. A device for securing, particularly during laundering, and storing paired socks which comprises: a clip having, first and second members for securing the paired socks therebetween, an apex member connected to one end of each of said first and second members, a clasp connected to the end of said first member opposite the end connected to said apex member for receiving and securing the end of said second member opposite the end of said second member connected to said apex member, and first connecting means connected to said clip; and a box having a base; a back connected to said base, and a pair of walls connected to said base and to said back, and second connecting means for engaging said first connecting means thereby securing said clip to said box.

3,972,095

SLIDING CLASP FASTENER

Akiyoshi Kandou, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 403,955, Oct. 5, 1973, which is a continuation of Ser. No. 244,036, April 14, 1972. This application Apr. 8, 1975, Ser. No. 566,063
Claims priority, application Japan, Apr. 20, 1971, 46-30709
Int. Cl.² A44B 19/36
U.S. Cl. 24—205.11 F 3 Claims



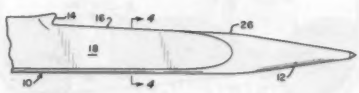
1. A sliding clasp fastener comprising: a pair of opposed stringer tapes each carrying along their respective marginal edge a row of plastic fastener elements each having a coupling head engageable between the coupling heads of two fastener elements on the other stringer tape and each having a base portion remote from said coupling head and jointly defining with said coupling head a given direction of each coupling element; a slider movable along the rows of fastener elements and having side flanges engageable with the base portions of the fastening elements in both stringer tapes to releaseably fasten together the coupling heads of the fastener elements on said opposed stringer tapes in response to movement of said slider in one direction and having a cam engageable with the fastened together coupling heads to unfasten same in response to movement of said slider in the other direction; and stop means for limiting the movement of said slider at an end of the fastener, said stop means comprising an arcuate stop member composed of plastic and extending along the respective base portions of a plurality of elements located at an end portion of each row of fastener elements and being directly fused to and forming part of the base portion of those elements so that said arcuate stop member extends in said given direction away from the base portions of those elements and has a thickness substantially equal to the thickness of the base portions of those elements adjacent said base portions and tapering in said given direction to a thickness less than the thickness of the base portion, of those elements and a solid portion terminating in a smooth and continuously extending contact surface engageable with an inner side wall of the flanges of the slider during movement thereof in said one direction to limit the movement of said slider.

3,972,096

FELTING NEEDLE

Edward A. Ohotnicky, Torrington, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Oct. 16, 1974, Ser. No. 515,323
Int. Cl.² D04H 18/00
U.S. Cl. 28—4 N 1 Claim



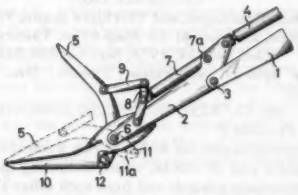
1. A felting needle comprising: a body portion, said body portion having a pointed end and at least one barb with a throat surface extending into the pointed end, the cross section of the body portion behind the barb being substantially triangular, and the cross section of the body portion along the throat surface and behind the pointed end being a truncated triangle, the throat surface being at a negative angle with respect to the axis of the body portion.

3,972,097

TOOL FOR ATTACHMENT TO THE DIPPER ARM OF AN EXCAVATOR

Rudi Schakat, Schloss Neuhaus, Germany, assignor to O & K Orenstein & Koppel Aktiengesellschaft, Berlin, Germany

Filed Oct. 10, 1974, Ser. No. 513,764
Int. Cl.² E02F 3/28
U.S. Cl. 29—33 R 1 Claim



1. In combination with a dipper arm having a free end portion and forming part of an excavator, a tool including an extension member fixedly connected to said dipper arm and projecting beyond said free end portion of said dipper arm and

having an outer free end, ripping tooth means rotatably supported by said free end portion of said dipper arm, and together with said extension member forming a gripping and shearing structure simultaneously, power operable means supported by said dipper arm and operatively connected to said ripping tooth means for selectively pivoting said ripping tooth means toward and away from said extension member, said ripping tooth means forming a two-arm lever having a longer arm for cooperation with the outer free end of said extension member and also having a shorter arm, first shear means supported by said extension member and in operative position facing said shorter arm, and second shear means supported by said shorter arm for cooperation with said first shear means in response to the pivoting of said shorter arm toward said first shear means.

3,972,098

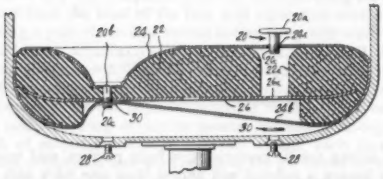
METHOD OF PRODUCING AN UPHOLSTERED ITEM OF FURNITURE

Andrew I. Morrison, Brooklyn, and Bruce R. Hannah, Staten Island, both of N.Y., assignors to Knoll International, Inc., New York, N.Y.

Division of Ser. No. 287,234, Sept. 8, 1972, Pat. No. 3,807,800. This application Sept. 26, 1973, Ser. No. 400,712

Int. Cl.² B68G *7/05, 7/12*

U.S. Cl. 29—91.1 **2 Claims**



1. A method of producing an upholstered item of furniture comprising completely upholstering a stiffly flexible substantially flat plate while said plate is in its substantially flat and non-flexed state, flexing the completely upholstered plate to a desired and final curvature, and securing the completely upholstered plate in its flexed state of desired and final curvature to complete the item of furniture without further upholstering so that all upholstering is completed while said plate is substantially flat.

3,972,099

CENTERING DEVICE FOR BODIES HAVING CIRCULAR CROSS-SECTION

Curt Olsson, Bandhagen, and Thorbjorn Sahlin, Vasteras, both of Sweden, assignors to AB Asea-Atom, Vasteras, Sweden

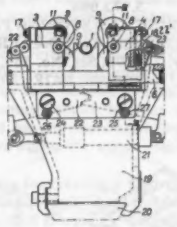
Filed Dec. 24, 1974, Ser. No. 536,228

Claims priority, application Sweden, Dec. 31, 1973, 73176166

Int. Cl.² B23P *19/00;* **B23K** *37/04, 1/14*

U.S. Cl. 29—200 P **4 Claims**

1. Centering device for bodies having a round cross-section comprising a pair of blocks, means mounting the blocks for sliding movement towards and from each other along a single straight line, power means for producing movement of the blocks, at least one of the blocks having a frame mounted thereon for swinging about an axis perpendicular to the direction of block movement, guide roller means turnably mounted on the frame, said roller means having diverging surfaces engageable with a tube, and adjustable means carried by the block and the frame to limit the swinging movement of the



frame with respect to the block during operation of the centering device.

3,972,100

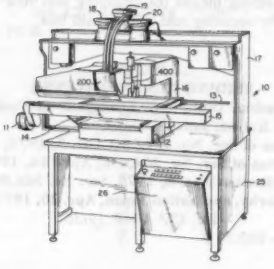
TRANSISTOR SEQUENCER INSERTER APPARATUS

Albert W. Zemek, Binghamton; Matthew R. Valla, Apalachin, and Frederick G. Tomko, Vestal, all of N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Oct. 29, 1974, Ser. No. 518,626

Int. Cl.² H05K *3/30*

U.S. Cl. 29—203 B **12 Claims**

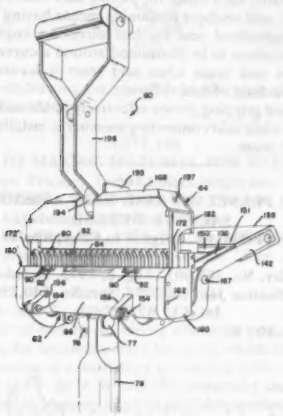


1. An apparatus for sequentially selecting a predetermined electrical component, transferring it to a position whereupon it is inserted into a circuit board and clinching said component, said apparatus comprising a magazine means, transport means for selecting components from said magazine means and transporting them to a transfer position, component insertion means for taking components from said transport means at said transfer position and for inserting them into pre-existing holes in a circuit board, said component insertion means including a swing arm means, having a collet means on the end thereof, for swinging out and picking up components from said transfer means by engaging them with its collet means and bringing them back to an in-line insertion position, means for holding said circuit board in varied positions and orientations to said insertion means and for repositioning said circuit board between insertion cycles and means for cutting and clinching said component leads located beneath said circuit board.

3,972,101
TOOL FOR TRIMMING WIRES AND INSERTING THE TRIMMED WIRES INTO A CONNECTOR

Daniel Thomas Casey, and William Roderick Over, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 10, 1975, Ser. No. 630,590
Int. Cl.² H01R 43/04
U.S. Cl. 29—203 MW **11 Claims**



1. Apparatus for inserting a plurality of wires into the wire-receiving portions of a plurality of electrical contact terminals, said terminals being mounted on a planar surface of a stackable electrical connector module, each of said terminals having a platelike portion extending from said planar surface and having a free end, each of said terminals having a wire receiving slot extending inwardly from said free end, said apparatus comprising:

frame means, said frame means having connector supporting surface portions thereon for supporting said connector module,

wire jig means for locating said wires with their axes extending across a connector module which is supported on said supporting surface portions and with said axes in alignment with said wire receiving slots,

inserting means for moving said wires laterally of their axes and into said wire-receiving slots in said terminals,

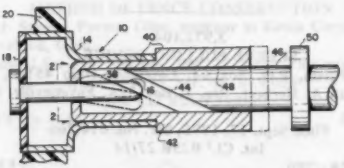
selective positioning means for said wire jig means for selectively positioning said wire jig means in first and second positions, said wire jig means being effective in said first position to locate said wires in alignment with said slots in said terminals in a first connector module supported directly on said connector supporting surface portions, said wire jig means being effective in said second position to locate said wires in alignment with said slots in said terminals in a second connector module supported on said first connector module.

3,972,102
MEANS FOR MAKING AN ELECTRICAL CONNECTOR

Benjamin W. Coler, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 12, 1975, Ser. No. 576,637
Int. Cl.² H01R 43/00
U.S. Cl. 29—206 D **3 Claims**

1. A means for bending the outer end portion of a center pin of a P.C. plug having a cup-shaped member with an inner wall around and spaced from the center pin, comprising a sleeve-shaped fixture having a restricted end wall portion mounted for simultaneous slidable movement along the inner wall of the cup-shaped member of said plug and along the outer end portion of said center pin, a cylindrical shaped tool having a tapered end for inserting between an inner wall portion of said sleeve-shaped fixture and an outer surface of the outer end portion of said center pin that extends into said sleeve-shaped

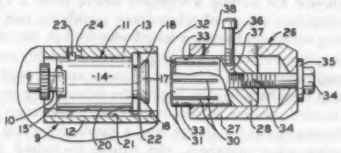


fixture to thereby effect the bending of said outer end portion of said pin, and said restricted end wall portion of said sleeve-shaped fixture being movable into engagement with said bent portion of said pin to tilt said pin as said fixture is slid along and off the outer end of said pin.

3,972,103
AUTOMOBILE LOCK REMOVAL TOOL

David L. Kenyon, 1727 W. Royalton Road, Broadview Heights, Ohio 44147

Filed Mar. 12, 1975, Ser. No. 557,821
Int. Cl.² B23P 19/04
U.S. Cl. 29—263 **3 Claims**



1. A tool for removing a lock cylinder from a lock housing, the lock cylinder having an exposed outwardly projecting shoulder around the forward portion of the cylinder, the tool comprising:

a cylindrical inner collet having a bore which extends inwardly from the forward edge of the collet and which provides a hollow interior, the collet having a plurality of slots extending longitudinally inwardly from the forward edge of the collet and extending less than the entire length of the collet, said slots providing a plurality of circumferentially disposed longitudinally extending fingers, each having a lip extending radially inwardly at the forward edge of the collet, the forward edge of the lip being beveled to facilitate application of the lip over the shoulder of the cylinder, the collet also having a hole along the side of the collet;

an outer shell which fits over the collet, the shell having a cylindrical bore which extends inwardly from the forward edge of the shell and which provides a hollow interior, the inner diameter of the hollow shell interior slightly greater than the outer diameter of the collet permitting the shell to fit over the collet, the shell urging the fingers firmly into engagement with the lock cylinder when the collet is drawn into the shell, the inner forward edge of the shell being beveled to aid in urging the lips inwardly, the shell also having a slot running longitudinally along the side of the shell;

means for drawing the collet into the shell interior, which drawing means being inserted through the rear portion of the outer shell and threaded into the rear portion of the collet along the common axis of both the collet and the outer shell; and

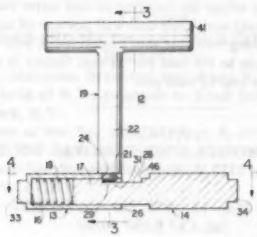
means for holding the collet and preventing it from turning when the collet is being drawn into the shell, said holding means extending radially outwardly from the collet and the shell and being threaded into the hole along the side of the collet and extending through the slot along the side of the shell.

3,972,104

SLEEVE PULLING DEVICE

Roy A. Partin, P.O. Box 64, Loveland, Ohio 45140, and Meredith A. Herbert, Rte. 1, Box 57A, Fayetteville, Ohio 45118

Filed Sept. 17, 1975, Ser. No. 614,266
Int. Cl.² B25B 27/14
U.S. Cl. 29—280 3 Claims



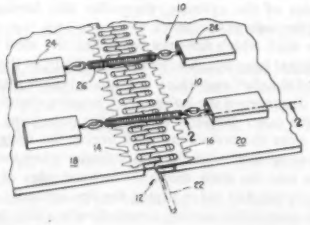
1. A device for pulling a cylinder sleeve from a cylinder which comprises a pair of telescoping members, one of the telescoping members having a lengthwise socket, the other of the telescoping members including a portion slidably mounted in the lengthwise socket, a boss at an outer end of each of the telescoping members, means urging the telescoping members to an extended position in which the bosses are receivable in opposed openings in the sleeve, and a handle attached to one of the telescoping members, the handle including an end portion extending through a transverse opening in the first telescoping member and into the socket, the portion of the other telescoping member received in the socket having means engageable with the end portion of the handle to limit outward movement of the telescoping members.

3,972,105

SEAM GRIPPING DEVICE

Benton S. Miller, Bastrop, La.; William Douglas Lee, Simpsonville, and Ralph Ligon King, Jr., Fountain Inn, both of S.C., assignors to Mount Vernon Dryer Felt Co., Greenville, S.C.

Filed Mar. 3, 1975, Ser. No. 554,730
Int. Cl.² B23Q 3/154; F16G 3/00
U.S. Cl. 29—283 4 Claims



1. A seam gripping device for temporarily holding the ends of a belt together while a connecting member is installed at a seam thereof for uniting the ends together in a more permanent manner as said belt is carried about rollers, said gripping device comprising:

a. a pair of block members spaced apart bridging said seam with a block member spaced on each side of said seam;
b. said block members having a bottom portion with sharpened pins carried therein for engaging said belt;
c. said pins carried in each of said block members inclined with respect to the pins carried in the other of said block members; and
d. resilient tensioning means coupled between said longitudinal block members resiliently urging said block members towards each other for pulling said ends of said belt together, said resilient tensioning means having flexibility in a longitudinal and vertical direction enabling said block members to be positioned around a curved surface and over said seam when said seam is located over a curved surface of said rollers;

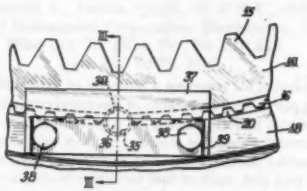
whereby said gripping device effectively holds said belt ends secured while said connecting member is installed to form said belt seam.

3,972,106

PINNED-ON PLANETARY RING GEAR ASSEMBLY AND SALVAGE METHOD

Robert S. Orr, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 385,901, Aug. 6, 1973, abandoned. This application Jan. 10, 1975, Ser. No. 540,256
Int. Cl.² B23P 7/00
U.S. Cl. 29—401 R 5 Claims



1. In a ring gear assembly having an annular ring gear housing and housing means for supporting said ring gear wherein the ring gear and housing means are provided with engaging spline means for preventing relative rotation of said ring gear with respect to said housing means, a method of repairing said ring gear assembly when said housing means spline means become worn and unable to prevent said relative rotation comprising the steps of;

a. providing a first plurality of semicircular recesses in said ring gear at the interface thereof with said housing means,
b. providing a second plurality of semicircular recesses in said housing means contiguous with said first plurality at the interface between said ring gear and said housing means,
c. inserting a pin member in each of the apertures formed by said first and second contiguous pluralities of semicircular recesses,
d. securing said pin member from axial movement.

3,972,107

METHOD OF FORMING SHEAR SECTIONS IN POSTS

Robert F. Deike, Cheyenne, Wyo., assignor to Foresight Industries, Cheyenne, Wyo.

Division of Ser. No. 546,326, Feb. 3, 1975, Pat. No. 3,939,563. This application June 23, 1975, Ser. No. 589,579
Int. Cl.² G09F 7/00
U.S. Cl. 29—401 R 4 Claims

1. The method of increasing the safety of hollow highways posts after they are mounted in the ground alongside a highway which comprises surrounding the portion of the post just above ground level with gripping jaws reinforcing the post against deformation driving a punch into the jaw surrounded portion of the post to form a hole in the one side of the post

facing in the direction of on-coming traffic on the highway, thereby forming a weakened shear section at ground level of

the post, withdrawing the punch from the post, and releasing the jaws from the post.

3,972,108

METHOD OF MAKING MATERIAL FOR HARD FACING

Lars Torsten Ericson; Lars Gosta Ljungstrom, and Gustaf Henrik Widmark, all of Sandviken, Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden

Filed Aug. 26, 1975, Ser. No. 608,009

Claims priority, application Sweden, Aug. 30, 1974, 7410979

Int. Cl.² B22F *3/00*

U.S. Cl. 29—420.5 **9 Claims**

1. Method of making a welding electrode in the shape of a wire or strip for automatic hard facing, in which the electrode material consists of a hard alloy containing 0.05 – 5.0 % C, 5 – 35 % Cr, 0.5 – 20 % W and the remainder essentially Co besides normally present impurities, which method comprises preparing a body of a brittle, easily crushed pre-alloy consisting of carbide and/or sigma-phase by melt-metallurgical means, the pre-alloy containing the contents of Cr and W of the final hard alloy besides essential amounts of C and/or Co; finely dividing the prepared pre-alloy into a powder; thereupon adding any missing amount of C and/or Co; compacting the so-prepared powder into a coherent mass; and finally working the mass into a ductile, workable product.

3,972,109

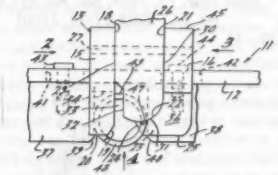
CUTTING FIXTURE FOR SPIRAL BINDERS AND METHOD OF MANUFACTURE

Albert E. Sickinger, Bloomfield Hills, Mich., assignor to Hans Sickinger Co., Pontiac, Mich.

Filed Aug. 8, 1975, Ser. No. 603,000

Int. Cl.² B23P *11/00;* **B21F** *35/02*

U.S. Cl. 29—434 **6 Claims**



6. A method of manufacturing a cutting fixture comprising the steps of milling a vertical slot in a cutter body starting from the top so as to create parallel sides having facing surfaces, terminating said milling cut before the bottom of the body is reached whereby an arcuate surface is formed, forming coil-supporting surfaces on the lower portions of said sides, cutting out the bottom of said body flush with one surface of said two parallel surfaces until the milling cut is reached, said cut being of a width substantially less than the milling cutter width, whereby an arcuate extension is formed on the bottom of one side of the body extending toward the other side, forming a cutter blade having a surface portion complementary to said arcuate extension and a relieved portion adjacent said one surface, and pivotally mounting said cutter blade between said two body sides so that the two complementary surface portions are closely adjacent each other to provide a shearing action and the relieved portion of the blade will permit bending of the coil end.

3,972,110

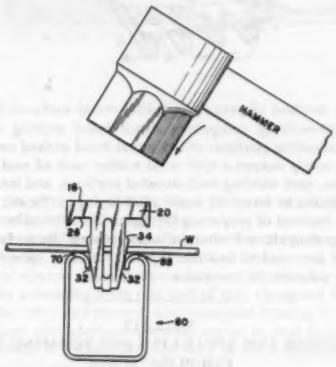
METHOD OF FENCE CONSTRUCTION

John J. Sasena, Parma, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 536,146, Dec. 24, 1974. This application May 27, 1975, Ser. No. 619,095

Int. Cl.² B21D *39/00*

U.S. Cl. 29—452 **2 Claims**



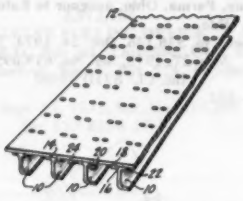
1. A method for assembling a fence comprising the steps of:
a. providing at least one end support for each end of the fence;
b. fixing said end supports at each end of the planned fence;
c. providing a plurality of cross-sectionally channel shaped fence posts, said posts comprising a pair of generally parallel side walls, a rear wall extending perpendicularly inbetween said side walls and a pair of inturned flanges extending from the front edges of said side walls;
d. fixing said fence posts at approximately equally intervals inbetween said supports;
e. providing at least one strand of fencing wire of sufficient length to extend the length of the fence, said fencing wire strand being of a predetermined maximum diameter;
f. fixing at least one end of the fence wire strand to at least one of the end supports with the remainder of the wire extending along the line of fence posts;
g. lying the wire across the forward edges of the inturned flanges of the post at the desired axial location of the post;
h. providing a plurality of one-piece fasteners for mounting the wire generally perpendicularly to the posts, said fasteners adapted for mounting said strand for movement along the axis of the strand relative to the posts, sad fasteners being of generally "U" shaped cross-section comprising a pair of substantially flat, generally parallel, generally "T" shaped members joined along substantially the entire tops thereof by a bight portion, said "T" shaped members comprising a top portion which in combination with the bight portion forms a trough of larger dimension than said maximum diameter for receipt of the strand and a dart shaped base portion adapted for forceful insertion inbetween and permanent retention by said inturned flanges; and
i. installing said fasteners to said posts by placing said dart shaped bases at the opening between the inturned flanges, with the strand received between the "T" shaped members, and then sharply striking the bight portion to force said dart shaped base portion between said inturned flanges.

3,972,111

SURFACE PREPARATION METHOD

Edward Dash, Long Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Mar. 13, 1975, Ser. No. 557,977
Int. Cl.² B23P 3/00, 25/00
U.S. Cl. 29—458 7 Claims



1. A method of preparing faying metal surfaces for adhesive-spot-welding comprising metal bond etching said surfaces, abrading portions of the metal bond etched surfaces to subsequently accept a spot weld within each of said abraded portions, spot welding said abraded portions, and introducing an adhesive to cover all unabraded faying surfaces.

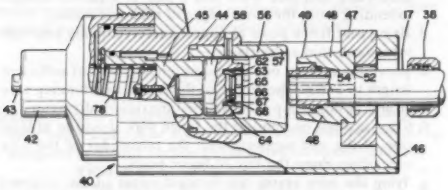
3. A method of preparing faying surfaces for adhesive-spot-welding as in claim 1 wherein, after etching, the surfaces to be welded are masked and the exposed surfaces sprayed with a primer solution for corrosion resistance.

3,972,112

METHOD AND APPARATUS FOR FORMING TUBE COUPLING JOINT

Lawrence B. O'Sickey, Cleveland Heights, and Jerry V. Koski, Parma, both of Ohio, assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Division of Ser. No. 526,701, Nov. 25, 1974. This application Sept. 2, 1975, Ser. No. 609,205
Int. Cl.² B23P 19/04
U.S. Cl. 29—516 11 Claims



1. The method of mounting a sleeve on a tube of predetermined diameter wherein the sleeve has a contractible portion at one end thereof provided with a generally transverse shoulder and wherein said transverse shoulder has an initial inside diameter no smaller than said predetermined diameter, said method comprising telescoping the sleeve over the tube to a fixed axial position relative to the tube and in which position said shoulder faces toward one end of the tube and is axially spaced therefrom, holding the tube and sleeve in said fixed position relative to each other, expanding said end of the tube to a diameter larger than said sleeve shoulder initial diameter, then contracting said sleeve portion to reduce the inside diameter of said sleeve shoulder to cause said sleeve shoulder to engage said tube immediately adjacent said expanded portion.

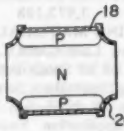
7. Apparatus for mounting a sleeve upon a tube of predetermined diameter wherein the sleeve has a contractible portion at one end thereof provided with a generally transverse shoulder that has an initial inside diameter no smaller than said predetermined diameter, said apparatus including a first means for holding the sleeve and tube in a fixed axial position relative to each other with the sleeve shoulder axially spaced from one end of the tube, second means for expanding said end of the tube, and third means for contracting said sleeve contractible portion to reduce the inside diameter of said sleeve shoulder.

3,972,113

PROCESS OF PRODUCING SEMICONDUCTOR DEVICES

Josuke Nakata; Takeshi Yamamoto, and Hitoshi Matufuzi, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1974, Ser. No. 467,563
Claims priority, application Japan, May 14, 1973, 48-53421; Feb. 28, 1974, 49-24547
Int. Cl.² B01J 17/00
U.S. Cl. 29—580 5 Claims



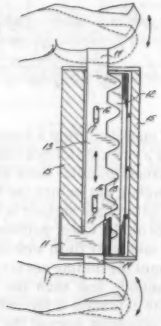
1. A process of producing semiconductor devices comprising the steps of diffusing a one type-conductivity imparting material into the entire area of a main face of a substrate of semiconductive material having the other type conductivity to form a P-N junction therein, partly removing the diffused semiconductive material from said substrate in selected areas of said main face to leave that material above said P-N junction, further diffusing said impurity into said semiconductive material of said substrate to modify said PN junction so that the PN junction is shallow in depth in said selected area while it is deeper in the remaining areas, etching said selected areas of said main substrate face to form grooves deeper than the associated portion of said modified P-N junction, applying a passivation layer to each of said grooves to protect that portion of said modified P-N junction exposed to the surface of each groove, and cutting said substrate along said grooves to divide it into a plurality of pellets.

3,972,114

SELF-CLEANING MECHANISM FOR TWIN BLADE RAZORS

Albert Chao, Northvale, N.J., and Frank Fantigrossi, Medford, N.Y.

Filed Mar. 12, 1975, Ser. No. 551,040
Int. Cl.² B26B 21/22, 21/40
U.S. Cl. 30—41 6 Claims



1. In a razor blade system comprising a blade case having a bottom support and a top cap, further comprising a pair of

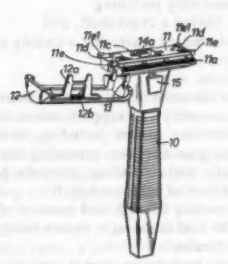
razor blades with cutting edges on the forward edges thereof and mounted between the support and the cap, the improvement comprising: a blade system cleaning mechanism; said cleaning mechanism being slidably mounted between said blades in said case; means connected to the cleaning mechanism to impart manual reciprocatory motion to the cleaning mechanism in a direction parallel to the blade edges.

6. The system of claim 1 wherein blade spacer means are formed from the bottom blade and extend upwardly to a position slightly higher than the top surface of the cleaning mechanism.

3,972,115
SAFETY RAZORS

Michael F. Ross, Whitley Bay, England, assignor to Wilkinson Sword Limited, Great Britain

Filed May 22, 1974, Ser. No. 472,186
Claims priority, application United Kingdom, May 24, 1973, 24927/73; June 13, 1973, 28046/73
Int. Cl.² B26B *21/32*
U.S. Cl. 30—59 **5 Claims**

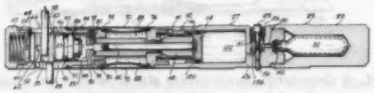


1. A safety razor comprising a guard bar, said guard bar having two guard surfaces on opposite sides of the guard bar, said guard bar further having an upper razor blade receiving surface and an under surface with a stem portion depending centrally from said under surface, a top cap, said top cap having an upper surface, an under surface and a first position in which the under surface of said top cap covers the upper surface of said guard bar, link means having a first end hinged to said guard bar and a second end hinged to said top cap for swinging said top cap from said first position to a second position in which the upper surface of said guard bar is uncovered, a handle, said handle having a shank at its upper end which shank is rotatably mounted in said guard bar stem portion, a catch for securing said top cap in said first position, said catch having a first component secured to the under surface of said top cap and having a second component within said guard bar stem portion, said first catch component and said second catch component being in catched engagement when said top cap is in said first position, and clamp means including said second catch component being in screw-threaded engagement with said handle and being restrained from rotation by engaging said guard bar stem portion for moving said top cap from said first position to a third position in which said top cap is drawn closer to the upper surface of said guard bar than in said first position upon rotation of said handle in one direction relative to said guard bar stem portion.

3,972,116
SHEAR

Alan K. Forsythe, and Charles J. Green, both of Vashon, Wash., assignors to Hazleton Laboratories Corporation, Vienna, Va.

Filed Feb. 14, 1975, Ser. No. 550,019
Int. Cl.² B23D *15/14*; B26B *15/00*
U.S. Cl. 30—228 **12 Claims**



1. A pin shear for cutting bone pins and other elongate objects, said pin shear comprising:

an elongated housing including a cutter plug chamber, a hydraulic chamber, a pneumatic chamber, and a pneumatic source chamber in end-to-end relationship in that order extending from one end of said elongated housing to the other end thereof, said elongated housing including at least one aperture allowing access to said cutter plug chamber in a direction transverse to the longitudinal axis of said elongated housing;

a cutter plug means slideably mounted in said cutter plug chamber so as to be movable along the longitudinal axis of said elongated housing between first and second positions, said cutter plug means including at least one aperture extending along an axis transverse to the axis of movement of said cutter plug means, said at least one aperture of said cutter plug means being aligned with said at least one aperture in said elongated housing when said cutter plug means is in said first position and said at least one aperture in said cutter plug means being nonaligned with said at least one aperture in said elongated housing when said cutter plug means is in said second position;

a power piston means mounted in said hydraulic chamber so as to be movable along the longitudinal axis of said elongated housing, one end of said power piston means adapted to apply force to said cutter plug means in a manner such that said power piston means when moved towards said cutter plug chamber causes said cutter plug means to move from said first position to said second position;

hydraulic fluid contained in said hydraulic chamber on the side of said power piston means remote from said cutter plug chamber;

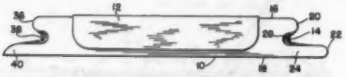
a pneumatic piston means mounted in said pneumatic chamber so as to be movable along the longitudinal axis of said elongated housing, said pneumatic piston means including a pneumatic piston and a slave piston, said slave piston mounted for movement into said hydraulic chamber when said pneumatic piston is moved toward said power piston means; and,

a valve mounted in said elongated housing between said pneumatic source chamber and said pneumatic chamber so as to control the flow of gas from said pneumatic source chamber into said pneumatic chamber, said flow causing said pneumatic piston to move said slave rod into said hydraulic chamber and thereby apply hydraulic pressure to said power piston means, said hydraulic pressure causing said power piston means to move said cutter plug means from said first position to said second position.

3,972,117
DISPOSABLE COMBINATION STITCH PICKER AND SEAM RIPPER

Walter K. Fogg, Feeding Hills, Mass.

Filed Mar. 13, 1975, Ser. No. 557,974
Int. Cl.² B26B 29/02
U.S. Cl. 30—287 5 Claims



1. A disposable combination stitch picker and seam ripper comprising a thin elongated disposable flat strip having dull side edges, a concave alcove formed at one end of the strip, a short projection at one side of the alcove and a longer projection at the other side thereof, both of these projections having rounded non-sharpened outer edges,

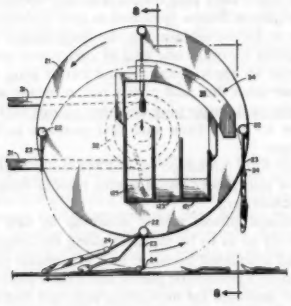
a sharpened edge in the bottom of the alcove, said edge being concave and forming a cutting member,

a relatively elongated pointed stitch picking prong at the opposite end of the strip, a second sharpened concave alcove adjacent thereto, and a forwardly projecting convexly curved dull member extending from the alcove to the edge of the flat strip opposite from the prong.

3,972,118
CULINARY ARTICLES AND APPARATUS FOR RETRIEVING AND/OR SORTING THE SAME

Wilton Richard, Rte. 1, Box 359-1/2, Shreveport, La. 71105

Division of Ser. No. 410,481, Oct. 29, 1973, Pat. No. 3,877,577. This application Apr. 14, 1975, Ser. No. 567,740
Int. Cl.² A47J 43/28
U.S. Cl. 30—296 A 10 Claims

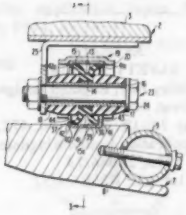


1. A plurality of different types of culinary articles in which each type of article has a magnetically responsive protuberance of essentially circular cross section extending from an end thereof, said protuberances differing in cross-sectional sizes according to the type of article, similar type articles having protuberances of the same cross-sectional size, and the balance of each of the articles, other than the protuberance, being essentially non-magnetically responsive.

3,972,119
CHAIN SAW WITH A BIFURCATED DIAPHRAGM MEANS PROVIDING A COAXIAL VIBRATION-ISOLATING UNIT

Jay Richard Bailey, Chatsworth, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed Aug. 25, 1975, Ser. No. 607,452
Int. Cl.² B27B 17/00; F16F 1/36
U.S. Cl. 30—381 16 Claims



1. In a chain saw having

a vibrating assembly including

an engine having a crankshaft, and

cutter chain means traversing a cutting path;

support means including

handle means; and

a plurality of vibration isolation means interconnecting said vibrating assembly and support means, with at least one of said vibration means including resilient diaphragm means having an aperture, extending transversely of said cutting path, and extending generally parallel with the axis of rotation of said crankshaft;

shaft means passing through said aperture of said diaphragm means, with said diaphragm means being journaled upon said shaft means;

first, resilient, impedance means, mounted on said shaft means, and abuttingly and separably engaging one side of said diaphragm means;

second, resilient, impedance means, mounted on said shaft means, and abuttingly and separably engaging an opposite side of said diaphragm means;

first mounting means connecting said diaphragm means with one of said vibrating assembly and said support means; and

second mounting means connecting said shaft means with the other of said vibrating assembly and said support means;

the improvement residing in said diaphragm means and comprising:

resilient, generally annular base means telescopingly mounted on said shaft means and located on said shaft means generally axially between said first and second impedance means;

first, resilient, generally toroidal segment means disposed generally outwardly of and supported by said generally annular base means and generally engageable with said first mounting means;

second, resilient, generally toroidal segment means disposed generally outwardly of and supported by said generally annular base means and generally engageable with said first mounting means;

generally annular, vibration and deflection-accommodating recess means located generally between said first and second generally toroidal segment means and encircling said generally annular base means;

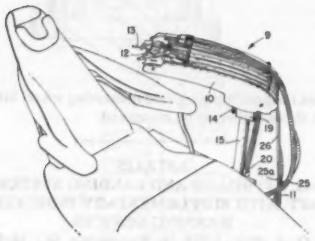
said first generally toroidal segment means cooperating with said second generally toroidal segment means to define a bifurcated diaphragm means extending generally between said first and second mounting means.

3,972,120

DENTAL INSTRUMENT TRAY DEVICE

Raymond Cope, 4285 Third Ave. South, P.O. Box 31053, Birmingham, Ala. 35222

Filed Feb. 28, 1975, Ser. No. 553,887
Int. Cl.[2] A61C 19/02
U.S. Cl. 32—22 8 Claims



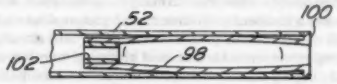
1. A dental instrument tray device free of connector tube-mounted retraction wheel apparatus, comprising in combination: an elongated support tray having a substantially horizontally-extending elongated upper face thereof shaped to define a plurality of substantially parallel grooves in juxtaposition to one-another along said upper surface, with the grooves each terminating at a forward end thereof with an end structure defining forward open end, a rearward end of the respective grooves being also open, a substantially flexible tubular connector element adapted for mounting free of any retraction-pulley wheel structure and seated within at least one of the grooves, the tubular connector extending and hanging downwardly from a rear end of the groove in which it is seated, instrument means for connecting a dental instrument operatively to a forward end of the tubular connector element, and a connected dental instrument seated engagingly at the forward open end of the groove, said forward open end and said dental instrument being structured to prevent the dental instrument from slipping from the forward open end into the groove rearwardly thereof, and an engaging element mounted circumscribingly around the tubular connector element and having a retainer structure of a shape for retaining engagement with the forward open end groove structure such that when pulled past the forward open end the engaging element is retainably engagable with the retainer of the forward open end thereby preventing the tubular connector element from slipping axially rearwardly in the groove while the engaging element remains engaged with the retainer structure, the engaging element relative to the forward open end having structure adapted such that disengagement may be effected by predetermined movement of the engaging element relative to the open end, whereby the tubular connector is thereby slidable retractably, and the engaging element includes a tubular structure having a forward flange and having elongated structure rearwardly extending along that portion of the tubular connector that is hanging downwardly, thus adapted to provide a predetermined amount of mass sufficient for weight thereof to effect rearwardly sliding of the tubular connector element axially of the longitudinal axis of the tubular connector element when the tubular connector element is in a pulled-forward state and when concurrently the engaging element is in a state of disengagement from the open end's groove structure.

3,972,121

PRESSURE REDUCER FOR AIR DRIVEN DENTAL HANDPIECE

John E. Nash, 145 Oak St., Downingtown, Pa. 19335

Filed Aug. 12, 1974, Ser. No. 496,605
Int. Cl.[2] A61C 1/10
U.S. Cl. 32—27 2 Claims



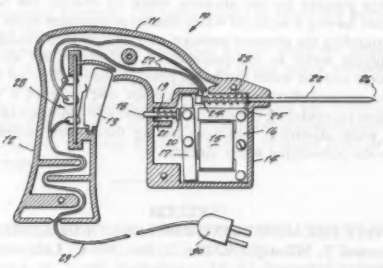
1. An air driven dental handpiece comprising a handle, means for securing a dental bur within said handpiece, means for supplying rotative power to said dental bur, said power supply means being air driven, conduit means within said handle for supplying air to said power supply means and means within said conduit means for reducing the pressure of the air reaching said power means, said pressure reducing means comprising tube means within said air conduit means, said tube means being frictionally engaged within said air conduit means, said tube means being slightly arcuate in shape and said conduit means being cylindrical, with said conduit means tending to straighten said tube means, thereby frictionally engaging said tube means in said air conduit means, said tube means having an internal diameter smaller than the internal diameter of said air conduit means, whereby air for driving said power supply means enters said conduit means at a first predetermined pressure and said air leaves said pressure reducing means at a second predetermined pressure, said second pressure being lower than said first pressure, and said second pressure being determined by the internal diameter of said tube means.

3,972,122

DENTAL ROUTER

James E. Sutter, Rte. No. 7, Box 177, Hot Springs, Ark. 71901

Filed Feb. 18, 1975, Ser. No. 550,551
Int. Cl.[2] A61C 3/03
U.S. Cl. 32—40 R 3 Claims



1. In a dental chipper which includes a generally pistol-shaped casing, a reciprocably endwise movable vibrating chipping member projecting forwardly from said casing and an electromagnetic driver within said casing effective to actuate said chipping member, the improvement wherein:

said casing includes a hollow pistol grip portion having a transversely extending lower wall, a forwardly extending hollow neck portion merging with the upper end portion of said pistol grip portion and means defining a forwardly positioned chamber depending from the forward end of said neck portion,

the cavities of said pistol grip portion and said neck portion merging to provide a continuous passageway from said lower wall of said pistol grip portion to said chamber,

said chamber being disposed forwardly from said pistol grip portion to define a space therebetween at an elevation above the underside of said chamber for receiving an operator's hand embracing said pistol grip portion, and a top wall of said chamber being interposed between the cavity therein and the cavity within said neck portion,

a reciprocably movable armature associated with said driver, a resiliently mounted rear piston disposed in the path of movement in one direction of said armature and spring means mounted on said chipping member continuously urging the rearward end thereof into the path movement of said armature in the opposite direction,

said electromagnetic driver being enclosed within said chamber and said chipping member extending forwardly from said driver through an opening in the forward wall of said chamber spatially subjacent to the top wall thereof, and

conductor means extending from said driver along said passageway to the outside of said casing at an aperture in the lower wall of said pistol grip portion.

3,972,123

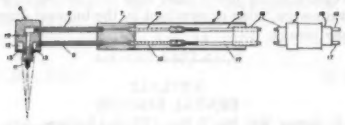
AIR-ABRASIVE PROPHYLAXIS EQUIPMENT

Robert B. Black, 2925 Denver, Corpus Christi, Tex. 78404

Division of Ser. No. 403,436, Oct. 4, 1973, Pat. No. 3,882,638. This application Dec. 11, 1974, Ser. No. 531,466

Int. Cl.² A61C 3/06

U.S. Cl. 32—58 5 Claims



1. A handpiece for delivering a stream of air carrying abrasive particles, comprising a nozzle having an abrasive discharge passage for the abrasive laden air stream, the nozzle further having a series of water discharge passages in an array surrounding the abrasive passage, and a water feed passage for supplying water to the passages of said array, the abrasive passage and the water discharge passages being directed in the same general direction to provide for discharge of a water curtain surrounding the discharging abrasive laden air stream, the water discharge passages having their axes inclined to provide converging water streams.

3,972,124

DEVICE FOR MEASURING THE LENGTH OF A MEMBER

Raymond F. Mikolajczyk, Rte. L, Box 309-C, Lafayette, La. 70501

Filed Mar. 14, 1975, Ser. No. 558,565

Int. Cl.² G01B 3/12

U.S. Cl. 33—134 R 8 Claims

1. A device for measuring the length of a member comprising:

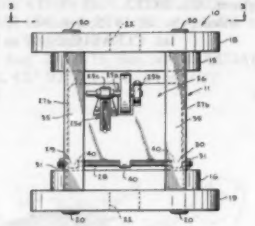
a. support means defining ends in spaced relation;

b. elastomer members on each of said ends having axially aligned openings for mounting said support means on the member whose length is to be measured;

c. a measuring wheel;

d. measuring wheel mounting means including means to support said measuring wheel for rotational movement;

e. means for pivotally securing said measuring wheel mounting means to said support means; and



f. means resiliently urging said measuring wheel into contact with the member to be measured.

3,972,125

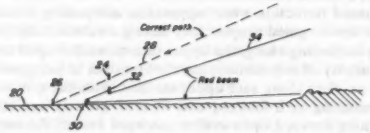
VISUAL APPROACH AND LANDING SYSTEM FOR AIRCRAFT WITH SUPPLEMENTARY INDICATING AND WARNING DEVICES

William O. Collins, 6258 N. Kensington St., McLean, Va. 22101

Continuation-in-part of Ser. No. 369,929, June 14, 1973, Pat. No. 3,868,778. This application Feb. 7, 1975, Ser. No. 548,100

Int. Cl.² G08G 5/00; G01C 21/00

U.S. Cl. 33—227 8 Claims



1. A visual approach indicator unit including three elongated bars, means mounting two of said bars in longitudinal alignment with each other, means mounting the third of said bars in parallel spaced relation to the two longitudinally aligned bars and centrally between said two of the bars, said two of the bars being longitudinally spaced from each other a distance slightly greater than the length of said third of the bars, visual means mounted on said bars for direct viewing of the bars themselves as closely spaced solid line segments in apparent longitudinal alignment with each other while approaching the same at a predetermined angle perpendicular to said bars, warning means with said two bars for direct viewing when approaching the bars at an angle substantially less than said predetermined angle, said warning means includes a red light, an opaque shield attached below and beside the two bars and disposed in alignment with the light for occluding the red light when approaching the elongated bars at said predetermined angle, and partially revealing said red light when approaching said bars at an angle slightly less than said predetermined angle and completely revealing the red light when approaching said bars at an angle substantially less than said predetermined angle to warn the observer that the approach path toward the bars is too low.

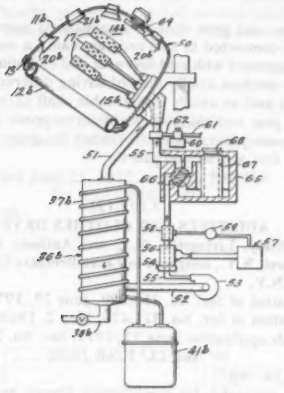
5. A visual approach guide system for aircraft approaching a runway of an airport along a predetermined path comprising slope indicator means directly viewable by a pilot to guide the pilot along the path and supplementary indicator means directly viewable by a pilot to provide directional information as to the correct path to be flown to the slope indicator means, said supplementary indicator means including a series of light means such that they appear in the pilot's view sequentially in order to enable the pilot to make a correct change in the flight path of the plane.

3,972,126

METHOD AND APPARATUS FOR DRYING HAIR

Frank P. DeMuro, 3324 Secor Road, Apt. No. 9, Toledo, Ohio 43606, and Norman G. Rapino, 2220 Robinwood Ave., Toledo, Ohio 43620

Filed July 18, 1974, Ser. No. 489,475
Int. Cl.² A45D 20/24
U.S. Cl. 34—3 19 Claims



1. A method of drying hair comprising the steps of establishing an enclosed space surrounding the hair to be dried separate and sealed from atmosphere, reducing the air pressure within and throughout such space to a sub-atmospheric pressure below ambient pressure, maintaining the sub-atmospheric pressure throughout the space and applying infrared radiation to the hair.

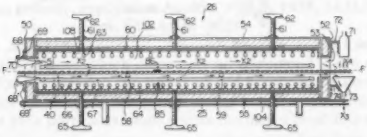
7. Apparatus for drying hair comprising, in combination, a helmet having an open end, said helmet defining an enclosed space adjacent the hair to be dried sealing means adjacent said open end of said helmet for separating said enclosed space from the atmosphere, vacuum means including a vacuum head mounted within such space and vacuum pump means located exterior of such space in fluid communication with said vacuum head for reducing the air pressure throughout such space, wherein a sub-atmospheric pressure is maintained throughout such space during drying and infrared means within such space for directing radiant energy toward the hair.

3,972,127

PROCESS AND APPARATUS FOR HEAT TREATMENT OF SYNTHETIC FIBER ASSEMBLIES

Toyohiko Hoshi; Masayoshi Shimojo, and Yasunori Suma, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sept. 12, 1974, Ser. No. 505,443
Claims priority, application Japan, Sept. 14, 1973, 48-104208
Int. Cl.² F26B 3/30
U.S. Cl. 34—4 11 Claims



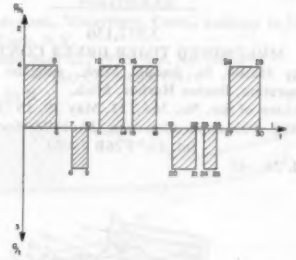
1. A process for heat treatment of synthetic fiber assemblies which comprises the steps of: continuously feeding a synthetic fiber assembly to one end of a horizontally elongated treating zone provided with series of far infrared ray radiation sources at the top and bottom thereof; continuously advancing said fiber assembly through said zone; irradiating said fiber assembly with far infrared rays from said series of sources, said far infrared rays having such an energy distribution that the peak wave length is within the range between 3.5 μ and 7.0 μ; forming an air curtain between said fiber assembly and each of said series of far infrared ray radiation sources by ejecting compressed air from said end of said zone into said zone, each air curtain being spaced from said fiber assembly and extending in parallel to said fiber assembly over substantially the whole width and length of said zone; keeping an atmosphere between said air curtains in said zone which directly contacts said fiber assembly at a temperature within the range between 80°C and 280°C; and continuously withdrawing said fiber assembly from the other end of said elongated treating zone.

3,972,128

PROCESS FOR DRYING HYGROSCOPIC MATERIALS

Viktor Vanicek, Hamerlingplatz 7, 1080 Vienna, Austria

Filed Dec. 20, 1973, Ser. No. 426,905
Claims priority, application Austria, Jan. 8, 1973, 146/73
Int. Cl.² F26B 3/00
U.S. Cl. 34—32 12 Claims



1. A process for drying hygroscopic materials at a predetermined humidity value which remains substantially constant throughout the process utilizing an automatic control associated with at least one timing means and humidity reduction means comprising the steps of:

activating humidity reduction means to lower the humidity of the drying means,

interrupting humidity reduction means when the humidity of the drying means reaches or drops below a predetermined humidity value, and

allowing a predetermined time interval for the humidity of the drying means to return to the predetermined humidity value in response to the release of moisture from drying material.

3,972,129

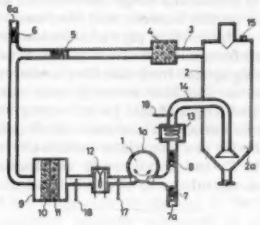
APPARAUS FOR THE ADSORPTION TREATMENT OF A GASEOUS MEDIUM

Roderich W. Graff, Kollwitzweg 19, 61 Darmstad-Arheilgen, Germany

Filed Nov. 4, 1974, Ser. No. 520,597
Claims priority, application Germany, Nov. 2, 1973, 2354745
Int. Cl.² F26B 3/04
U.S. Cl. 34—32 12 Claims

1. An apparatus for the adsorption treatment of a gaseous medium comprising, in combination, a single adsorption chamber having an inlet and an outlet and accommodating a regeneratable adsorbent intermediate said inlet and said outlet; conduit means communicating with said inlet and outlet, respectively; reversible blower means in said conduit means

for propelling the gaseous medium to be treated through said adsorption chamber in direction from said inlet to said outlet when operating in one direction, and for propelling ambient air through said adsorption chamber in direction from said outlet to said inlet when operating in the reversed direction;



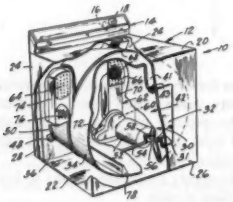
and valve means in said conduit means for preventing the ambient air from entering the conduit means when said blower means operates in said one direction while permitting the gaseous medium to be treated to enter said conduit means, and vice versa said blower means operates in said reversed direction.

3,972,130

MULTISPEED TIMER DRYER CONTROL

Anthony Mason, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 364,731, May 29, 1973, Pat. No. 3,886,802. This application Sept. 30, 1974, Ser. No. 510,406
Int. Cl.² F26B 19/00
U.S. Cl. 34—45 2 Claims



1. A clothes dryer comprising:

a drive motor for connection to an electrical supply; a timer including a timer motor for connection to the electrical supply, a plurality of sets of program contacts operable in a programmed sequence, a plurality of program cams driven by said timer motor to operate said plurality of contacts, pulsing contacts connected between said drive motor and the electrical supply, and a pulsing cam driven by said timer motor for periodically operating said pulsing contacts,

and means for changing the speed of operation of said program contacts at a predetermined time during the program for a predetermined interval;

a rotatable drum driven by said drive motor for receiving a clothes load;

heater means connected to the electrical supply via a first set of said program contacts for providing a flow of heated air to the clothes in said drum during a drying cycle; a second set of said program contacts shunting said pulsing contacts until said predetermined time whereupon said drive motor is periodically operated to intermittently tumble the clothes in said drum during said predetermined interval to prevent wrinkling of the clothes; and

a third set of said program contacts connected between said drive motor and the electrical supply and operated at the end of said predetermined interval to terminate a drying program,

said means for changing the speed of operation of said program contacts comprises a gear train connecting said timer motor to said program cams including a gear shifting arrangement operated by one of said program cams and

wherein said gear shifting arrangement comprises a first gear connected to said program cams, a second gear for engagement with said first gear and including at least two gear sections axially thereof having different numbers of teeth and an axially displaceable shaft carrying said second gear and axially movable in response to rotation of said one program cam to change the gear ratio between said first and second gears.

3,972,131

ADDITIVES FOR CLOTHES DRYERS

Jerome Rudy, Livingston, N.J., and Anthony A. Rapisarda, Elmhurst, N.Y., assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 158,090, June 29, 1971, which is a continuation of Ser. No. 821,476, May 2, 1969, abandoned. This application June 22, 1972, Ser. No. 265,124
Int. Cl.² F26B 19/00
U.S. Cl. 34—60 2 Claims

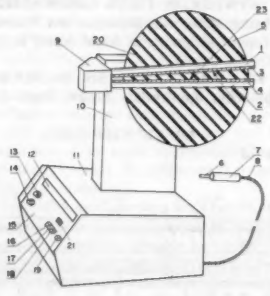
1. An apparatus for conditioning fibrous materials which comprises an automatic laundry dryer drum or similar container for fibrous materials, means for rotating the drum and tumbling fibrous materials contained therein and, held to an interior wall of the drum, in form-retaining relationship therewith, a base, having an exterior surface thereof a conditioning agent for the fibrous materials, which, on contact with such tumbling materials is removable from the base and depositable on the materials in sufficient quantity to condition them, said base comprising a flexible material and having an adhesive on the opposite surface thereof to effect said form-retaining relationship.

3,972,132

DEVICE TO DETECT HAND TREMORS OF VARIOUS CAUSES

Waclaw Kazimierz Slomski, 426 Wilkinson St., Syracuse, N.Y. 13204

Filed Jan. 28, 1975, Ser. No. 544,205
Int. Cl.² G09B 19/00
U.S. Cl. 35—22 R 10 Claims



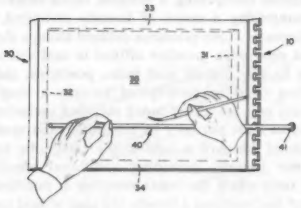
1. In psychological testing apparatus, a device comprising a pair of measuring levers which are spaced apart to define a longitudinal slot opening between them, each said lever in-

cluding electrical conductive means extending along said opening, each said conductive means including location discrimination means, electrically conductive probe means adapted to be received in said opening whereby it need not touch either said measuring lever, an electrical circuit means interconnecting said discrimination means with said probe means, an indicator means connected in said circuit means so that it automatically registers the distance along said opening where said probe touches at least one of said discrimination means, and handle means connected to said probe means whereby it is manually movable within said opening.

3,972,133
MAHL-STICK HOLDER

Raymond H. Parshall, 1011 El Sur Way, Sacramento, Calif. 95825

Filed June 25, 1975, Ser. No. 590,300
Int. Cl.² G09B *11/02*
U.S. Cl. 35—26 **8 Claims**



1. In combination with an artist's working surface and a mahl-stick of given cross-sectional dimensions; a mahl-stick holder comprising a U-shaped member having a bight portion and one leg shorter than the other leg, an aperture through said other leg at the free end thereof having cross-sectional dimensions larger than said given cross-sectional dimensions of said mahl-stick, and means associated with said bight portion and said legs of said U-shaped member for adjustably mounting said U-shaped member with said other leg thereof adjacent said working surface whereby said mahl-stick may be received through said aperture in said other leg for limited movement with respect to said working surface.

3,972,134
SKIING BOOT

Hermann Kastinger, Hauptstrasse 27, Seewalchen, Austria

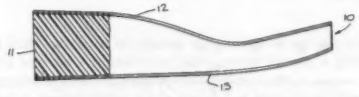
Filed May 27, 1975, Ser. No. 580,888
Claims priority, application Austria, May 5, 1975, 3431/75
Int. Cl.² A43B *00/00*
U.S. Cl. 36—118 **8 Claims**

1. A skiing boot which comprises an upper end and a sole integrally molded with the upper of synthetic resin material, the upper of the boot having an instep bend, a substantially stiff rear base portion extending from the instep bend to a rear end of the boot, an elongated top portion extending from the rear base portion for engagement with the lower leg of a skier above the ankle thereof, and a forward portion extending from the instep bend to a forward end of the boot, the forward portion being formed with areas of reduced wall thickness extending transversely to the longitudinal direction of the boot and disposed in at least one transversely extending zone between the instep bend and forward end whereby the forward portion is adapted to be bent about said zone.

3,972,135
PLATFORM FOR FOOTWEAR AND ARTICLE OF FOOTWEAR

Thaddeus Pietraszek, Waterbury, Conn., assignor to Uniroyal Inc., New York, N.Y.

Filed May 22, 1975, Ser. No. 580,079
Int. Cl.² A43B *13/16*
U.S. Cl. 36—30 R **5 Claims**

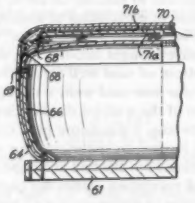


1. A platform for footwear comprising:
a body of polyurethane foam having a compression modulus in the range of 150 to 400 pounds per square inch;
a first layer of fabric integral with said body over the entire surface of said first fabric layer and forming the upper surface of the platform; and
a second layer of fabric integral with said body over the entire surface of said second fabric layer and forming the lower surface of the platform.

3,972,136
FOOTWEAR CONSTRUCTION

William H. Epstein, 1201 NE. 191st St., North Miami Beach, Fla. 33162

Filed Feb. 28, 1975, Ser. No. 554,277
Int. Cl.² A43B *3/24*
U.S. Cl. 36—101 **15 Claims**



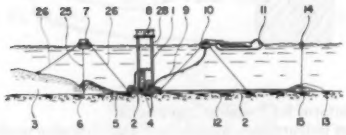
1. A footwear construction comprising a sole portion, a counter portion extending substantially upwardly from the

rearwardly peripheral region of said sole portion; vamp portion means extending substantially upwardly from the forwardly peripheral region of said sole portion; plug means dimensioned to substantially bridge the upper periphery of said vamp portion means and means for releasably securing together the periphery of said plug means to the upper periphery of said vamp portion means, said releasable securing means including first and second slide fastener teeth means for releasable interengagement, first means securing said first slide fastener teeth means to said plug means and second means securing said second slide fastener teeth means to said vamp means, at least one of said first and second securing means including at least a region formed of an elastic material, whereby said elastic material imparts elastic stretchability to the forward portion of the footwear construction to provide a foot-conforming fit.

3,972,137
DREDGING INSTALLATION

Elie Condolios, Grenoble, France, assignor to Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM), Paris, France

Filed Apr. 1, 1975, Ser. No. 564,152
Claims priority, application France, Apr. 24, 1974, 74.14298
Int. Cl.² G09B *25/00*
U.S. Cl. 37—56 5 Claims

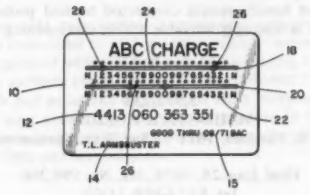


1. A dredging installation for use on a bed of a body of water, said installation comprising a fixed tower mounted on the bed of the body of water and extended above the surface of the water, a platform mounted on said tower above the surface of the water, said tower comprising at least one silo for storing and decanting dredged materials, a mobile dredging pipe connected to said silo and movable on the bed to the dredging site, a collecting device connected to said mobile pipe at the free inlet end thereof, a lift pump connected to said silo, a lift pipe connected to said lift pump and extending to a loading ship for delivering to said ship dredged material from said silo, a well connected to said silo at the upper end thereof to receive at a pressure at most equal to atmospheric pressure materials decanted in the silo consisting of water and fine materials of the mixture brought into the silo, an overflow pipe extending to the bottom of said well for conveying decanted materials from sad silo into said well, a dredging pump connected to the bottom of the well for discharging the water and the fine materials therein, a discharge pipe connected to the dredging pump and having an outlet end for discharging the water and fine materials onto the bed at a deposit site removed from said tower, and regulating means for constantly regulating said dredging pump to maintain in said well a liquid level such that the difference in pressure between such level and that of the surface of the body of water automatically produces a flow at a determined rate in said dredging pipe.

3,972,138
CREDIT CARD

Thomas L. Armbruster, 206 Ridgeway Drive, Norfolk, Nebr. 68701, and William N. Hill, 12411 Bel Drive, Omaha, Nebr. 58144

Filed Sept. 30, 1974, Ser. No. 510,283
Int. Cl.² G09F *3/02*
U.S. Cl. 40—2.2 8 Claims

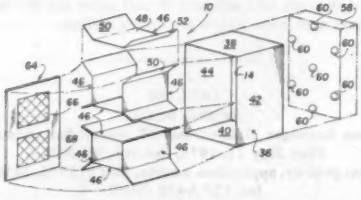


1. In a credit card construction of the type including lines of visible embossed numbers and information on the front panel and at least one strip of magnetic tape affixed to said card, said tape having information coded therein uniquely associated with the visible embossed information on said card, the improvement comprising a settable index mechanism in said card comprising a series of linearly arranged, serially ordered equispaced index positions defined along a slot in said card, at least one index member affixed in said slot and slidable therein to any one of said index positions, said index member being sized to correspond to only a single index position at any one time, said index member including a surface covered at least partially by magnetic tape material on the same side of the card as said strip of magnetic tape, said index member thereby providing additional identification information only when the index member is positioned in a certain one of the positions whereby the user of said card upon being advised of an appropriate index position associated with the proper use of said card can place said index member in said position whenever said card is to be properly used and can remove said index member from the defined proper position during periods of non use in order to frustrate confiscation and misuse of said credit card.

3,972,139
DEVICE FOR DISPLAYING NUMBERS

John J. Slomkowski, Bethpage, N.Y., assignor to Large Scale Readouts, Inc., Farmingdale, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,184
Int. Cl.² G09F *9/34*
U.S. Cl. 40—28 C 2 Claims



1. A display device using lights to form any number from zero to nine comprising a rectangular body having an identically sized top and bottom comparatively larger sized left and right sides, said top, bottom and left and right sides being arranged in cooperating facing relation to bound a light chamber, plural identical and interchangeable chamber-dividers each comprised of a springy metal held in said rectangular body under stress and having operative wedged positions against each other within said light chamber so as to sub-

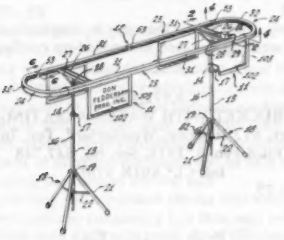
divide said light chamber into an open and unobstructed light conducting compartment comprising a first compartment adjacent said top, a second compartment adjacent said bottom, third and fourth compartments adjacent said left side, fifth and sixth compartments adjacent said right side, and a seventh compartment oriented horizontally of the medial portion of said light chamber, each said metallic chamber-divider having a medial panel and opposite angularly oriented side panels, said chamber-dividers located adjacent said top, bottom and sides being positioned with said medial panel of each held in clearance positions therefrom by said side panels to thereby form said compartments, and said medial seventh compartment being formed by two said chamber-dividers disposed in facing relation to each other, and seven lights each located in each one of said open and unobstructed seven compartments, whereby the energization of select combinations of said lights forms a number display in said light chamber.

3,972,140

PORTABLE DYNAMIC ADVERTISING DISPLAY SYSTEM

John J. Casparro, Canoga Park, Calif., assignor to Don Fedderson Productions Inc., Studio City, Calif.

Filed Jan. 15, 1975, Ser. No. 541,268
Int. Cl.² G09F *11/28*
U.S. Cl. 40—32 **13 Claims**



1. A dynamic advertising display system comprising:

an endless display path including two spaced apart elongated tubular straight run sections extending parallel to each other and a generally U-shaped tubular return path section extending between and communicating with the interiors of said straight run sectons at each end thereof, each of said straight run sections and said U-shaped sections having inner and outer side walls defining an open bottom, means disposed in the interior of each of said straight run sections and said U-shaped sections defining an endless guide path extending about the interior of said display path;

a plurality of roller assemblies disposed in spaced relation about the interior of said display path and carried by said guide path, each said roller assembly comprising an elongated body, the upper end of which extends above said guide path and having a roller journaled thereon for rotation about an axis normal to the longitudinal axis of said body and for travel along said guide path, the lower end of said body extending below said guide rail, at least one of said elongated bodies being adapted for carrying an advertising sign,

an endless drive belt disposed about said display path, said drive belt being affixed to each of said elongated bodies of said roller assemblies;

support means for said display path including a cross support extending between the end portions of said straight run sections and attached thereto and a vertically adjustable upright support attached to said cross support for supporting said display path for display of said advertising sign;

drive means carried by one of said cross supports adjacent one of said straight run sections for driving engagement with said drive belt as it passes along said straight run section; and

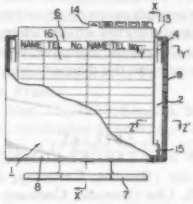
a plurality of idler rollers rotatably disposed in each of said U-shaped sections along the interior wall thereof for rotation about a vertical axis, said rollers being in contact with said drive belt as it passes through said U-shaped section for reducing frictional resistance and guiding said drive belt about said U-shaped section.

3,972,141

TELEPHONE NUMBER INDEXING DEVICE

Masaru Tai, 5-4-35-1208, Minami-Aoyama Minato, Tokyo, Japan (107)

Continuation of Ser. No. 477,045, June 6, 1974, abandoned.
This application July 25, 1975, Ser. No. 599,020
Int. Cl.² G09F *11/30*
U.S. Cl. 40—78 **5 Claims**



1. A card index for telephone numbers wherein the index is adapted to hold a plurality of index cards having a generally rectangular format, the index comprising:

a. index cards having a top portion, a bottom portion, and wing-like stopper tabs extending outwards from opposed sides of each of the cards at the bottom portion thereof and an index tab at the top portion thereof for pulling the card partly out of the casing;

b. an L-shaped foot portion with one leg of said foot portion extending under and being retained by a telephone;

c. a rectangular, elongated casing having an inner wall mounted on the other leg of said foot portion, and having an interior defining an index card holding chamber for holding therein a plurality of said rectangular index cards in an aligned manner with the index tabs extending outwardly of a casing opening; said casing having an upper longitudinal opening, vertically extending, right-hand and left-hand side plates, a front plate, and a rear cover plate, means for removably mounting said rear cover plate on said casing to facilitate the insertion of index cards into said chamber; and

d. a pair of card guide and stopper means mounted in opposed relationship along the inner wall of said casing adjacent said upper opening for engaging and retaining the stopper tabs of an associated index card, respectively whereby, any one of said index cards may be physically lifted by its tab into an exposed position, out of said casing, until the stopper tabs engage the respective card guide and stopper means.

3,972,142

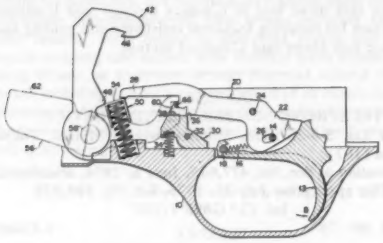
SHOT GUN

Takeji Kawamura, 1099-11 Ishinazaka-cho, Hitachi, Ibaragi, Japan

Filed Nov. 29, 1974, Ser. No. 528,152
Int. Cl.² F41C *19/00*
U.S. Cl. 42—69 R **8 Claims**

1. A shot gun comprising a trigger guard frame; a sear rotatably supported on said trigger guard frame; bias means

for urging the sear; a disconnector provided with a pushing portion for pushing the sear against the biasing force of the bias means; a trigger movably fitted to the trigger guard frame; connecting means for coupling the disconnector with the trigger; a hammer supported on the trigger guard frame to be releasably engaged with the sear; and a bias mechanism for



rotating the hammer when it is released from the sear, wherein there is further provided an engagement member integrally formed with the disconnector which, when the bias mechanism is actuated to rotate the hammer, is engaged with said bias mechanism to prevent the disconnector from pushing the sear again.

3,972,143

WEAPON FOR TARGET COMPETITION

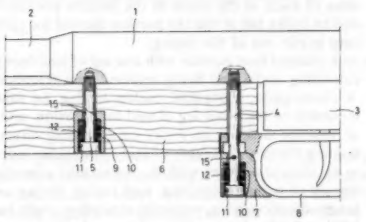
Hermann Wild, Ulm (Danube, Germany, assignor to J. G. Anschutz GmbH, Ulm (Danube, Germany

Filed Jan. 29, 1975, Ser. No. 545,226

Claims priority, application Germany, Feb. 6, 1974, 7404108

Int. Cl.² F41C *23/00*

U.S. Cl. 42—75 A **9 Claims**



1. A target competition firearm mounting wherein a stock is tensionally connected with a receiver by means of screws, which transmit their tensional forces by means of one spring assembly system each to said stock, each said spring assembly comprising a plurality of cup springs and being arranged in a flanged bushing inserted into said stock, said flanged bushing having circularly arranged section lines on its outer front surface and said screw having a radial index line on its head.

3,972,144

FISHING ROD AND REEL CASE

Francis E. Geisler, 236 "I" Ave., Nevada, Iowa 50201

Filed Aug. 25, 1975, Ser. No. 607,295

Int. Cl.² B65D *65/02*

U.S. Cl. 43—26 **9 Claims**

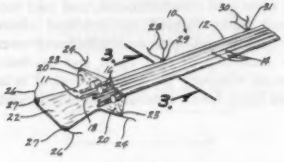
1. A protective case for carrying and storing assembled fishing rods and reels, comprising:

a body portion of a flexible material having a top and bottom layer with the sides and one end of said top and bottom layers attached together;

partitions forming elongated compartments, running parallel to the length of said body portion, each compartment having an open end and a closed end and adapted to hold the greater portion of a fishing rod, with the reel end remaining exposed;

a bottom portion connected to the end of said bottom layer adjacent said compartment opened ends, and on which the exposed reel ends may rest;

a pair of side flaps, each side flap attached to and extending laterally from said bottom portion in opposite directions, said



flaps being foldable laterally over each other and over the exposed fishing rod and reel ends;

an end portion connected to the outer end of said bottom portion and extended further away from said open ends, said end portion foldable longitudinally over said folded flaps;

tie means attached to said flaps and said end portion for securing said flaps and said end portion about said bottom portion; and

strap means attached to the case in longitudinally spaced relation for securing the case in a rolled-up configuration.

3,972,145

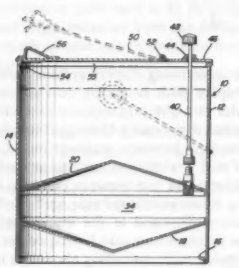
MINNOW BUCKET WITH WATER AERATING MEANS

James A. Key, 812 Hanover, Weatherford, Tex. 76086

Filed Feb. 6, 1975, Ser. No. 547,748

Int. Cl.² A01K *97/04*

U.S. Cl. 43—57 **2 Claims**



1. A minnow bucket with water aerating means, said bucket including peripherally continuous upstanding side wall portions, rigid upper and lower vertically spaced closure walls extending and sealingly secured across the lower end portions of said side wall portions and defining an upwardly opening water receptacle above said upper closure wall and a closed air-tight chamber between said closure walls, an upstanding tubular valve body supported from and opening through one side marginal portion of said upper closure wall, a valve element shiftably supported centrally within said valve body for movement between lower and upper open and closed limit positions, respectively, a support member threadedly engaged with the upper end of said body and including an abutment portion engageable with said valve element upon downward threading of said support member on said body to variably downwardly displace said element away from its closed limit position toward its open limit position for variably controlling

the venting of air from said airtight chamber through said tubular valve body into said receptacle and aerating the water therein, means operative to introduce air under pressure into said chamber, a stationary partial top wall secured over one side portion of the upper end of said bucket in vertical registry with said valve body, said support member being carried by the lower end of a substantially vertical operating rod whose upper end is rotatably received through said partial top wall, and a further top wall portion hingedly supported from said partial top wall swingable into and out of position, in coaction with said partial top wall, to substantially fully close the upper end of said bucket, said upper and lower closure walls being of upright and inverted conical shape, respectively, said support member comprising a downwardly opening internally threaded cap closed at its upper end, the lower end of said operating rod being secured downwardly through the closed upper end of said cap and including a lower terminal end projecting down into the interior of said cap and comprising said abutment portion, said cap including a lateral vent opening formed in one side thereof above said tubular valve body and below the closed upper end of said cap.

3,972,146

PROCESS FOR PROPAGATING STRAWBERRY PLANTS

Philippe Boxus, Brussels, Belgium, assignor to Station des Cultures Fruitieres et Maraicheres, Gembloux, Belgium

Filed July 17, 1975, Ser. No. 596,908
Claims priority, application Belgium, July 19, 1974, 146738
Int. Cl.[2] A01G *1/00*
U.S. Cl. 47—58 **4 Claims**

1. Process for the propagation of strawberry plants which comprises:

a. placing a strawberry plantlet having a leaf stalk and normally dormant axillary or adventive shoots at the base of said leaf stalk in an aqueous nutrient medium capable of sustaining said plantlet until a multiplicity of shoots is formed, said medium containing an amount of a cytokinin sufficient to enhance the formation of said shoots;

b. separating the formed shoots; and

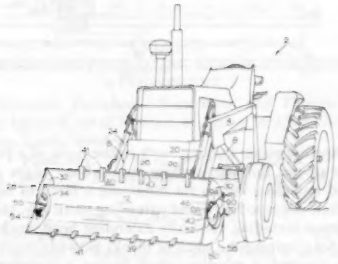
c. transplanting the separated shoots into another aqueous nutrient medium containing less than said amount of said cytokinin until each separated shoot develops leaves and roots, wherein said cyntokinin is N-benzyl6-aminopurine, said sufficient amount being 0.01 to 100 mg/l of said N-benzyl-6-aminopurine.

3,972,147

BUCKET AND CLOSURE MEMBER APPARATUS

Robert C. Bigham, Rte. 3, Topeka, Kans. 66608

Filed Dec. 17, 1971, Ser. No. 209,030
Int. Cl.[2] E06B *3/34;* **E02F** *3/14*
U.S. Cl. 49—41 **10 Claims**



1. A closure member apparatus for a load handling bucket which comprises:

a. a closure member having a closure member first side and closure member second side rotatably mounted on the bucket with the closure member first side lying over and adjacent to the bucket first side and pivotally mounted thereto and the closure member second side lying over and adjacent to the bucket second side and pivotally mounted thereto so that the closure member does not project substantially above the bucket when the closure member is in rearward position;

b. means for rotating the closure member mounted to the bucket,

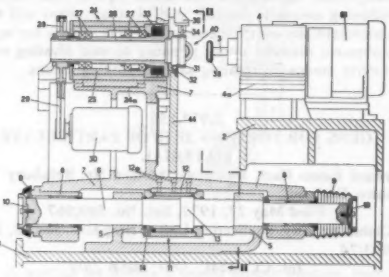
c. said means for rotating the closure member comprising a first closure member extensible hydraulic ram and second closure member extensible hydraulic ram mounted to the bucket; and a first cable and second cable both movably connected at opposite ends to the rod ends of the first closure member extensible hydraulic ram and second closure member extensible hydraulic ram and rigidly mounted to the closure member first side and closure member second side, respectively, intermediate the opposite ends of the first cable and second cable, for rotating the closure member.

3,972,148

MACHINE TOOL FOR FINISH-GRINDING THE INNER SURFACES OF ANNULAR WORKPIECES

Jean Beauchet, Veyrier du Lac, and Gerard Druge, Cran Gevrier, both of France, assignors to Societe Nouvelle de Roulements, Annecy, France

Filed Mar. 19, 1975, Ser. No. 559,741
Claims priority, application France, Apr. 8, 1974, 74.12305
Int. Cl.[2] B24B *5/10, 41/02*
U.S. Cl. 51—5 D **9 Claims**



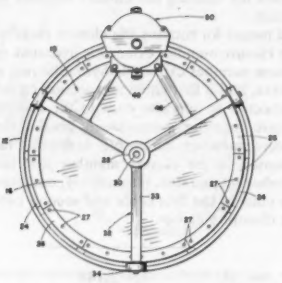
1. In a machine tool for finish-grinding the inner surfaces of annular workpieces, said machine tool including a frame, a grinding wheel support carried by said frame, a rotatable workpiece support, means for rotating said workpiece support, a table, means movably mounting said workpiece support on said table, and means supporting said table from said frame for movement parallel to the axis of rotation of said rotatable workpiece support, the improvement wherein said means supporting said table from said frame consists of a single horizontal spindle, means fixedly mounting said spindle on said frame at the lowermost portion of said frame, said spindle extending over a major part of the entire length of said frame, and means mounting said table on said spindle for sliding movement therealong and pivotal movement thereabout in a substantially vertical plane, said spindle being situated in another substantially vertical plane containing the axis of rotation of said workpiece support whereby said table is approximately neutrally balanced and, said spindle being mounted in said lowermost portion of said frame, the distance between said spindle and said axis of rotation of said workpiece support is maximized.

3,972,149

END BLASTER FOR PIPES

Robert J. Hart, Tulsa, Okla., assignor to Commercial Resins Company, Tulsa, Okla.

Filed Mar. 3, 1975, Ser. No. 554,510
Int. Cl.² B24C 3/24
U.S. Cl. 51—8 R 7 Claims



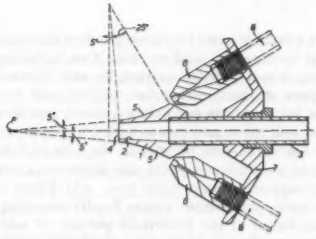
1. An end blaster for cleaning the end of a pipe comprising a locating means engagable with the interior of the pipe adjacent the end to be cleaned, said locating means having a substantially disc-shaped base, at least three circumferentially spaced and radially directed pipe-engaging elements mounted on said base and means for urging at least one of said pipe-engaging elements radially outwardly against the interior of said pipe, a movable positioning means rotatably mounted on said locating means, a blasting means mounted on said positioning means adjacent the end of said pipe so that, when said positioning means is rotated, said blasting means will move circumferentially over the end of said pipe, means for supplying abrasive material under pressure to said blasting means and drive means for rotating said positioning means.

3,972,150

GUNS FOR FORMING JETS OF PARTICULATE MATERIAL

Bernard Eaton Hart, Rosebank, Stoford Nr. Salisbury Wiltshire, England

Filed May 27, 1975, Ser. No. 580,967
Claims priority, application United Kingdom, June 5, 1974, 25003/74
Int. Cl.² B24C 3/00; B05B 7/08
U.S. Cl. 51—11 4 Claims



1. A gun for forming an abrasive jet of particulate abrasive material and liquid comprising:

a body defining a bore therethrough, said bore having an axis and an opening at one end;

means for connecting the other end of said bore to a conduit for supplying particulate abrasive material to said bore for ejection from said opening in the form of a jet of particulate abrasive material;

a pair of nozzles which, when connected to a supply of high pressure liquid, provide a pair of high pressure liquid jets, each nozzle being shaped to provide a generally circular-section jets of liquid;

means for connecting each nozzle to a supply of high pressure liquid;

means for mounting said nozzles symmetrically relative to said axis of said bore with axes of said nozzles in a common plane including said axis of said bore and inclined towards said axis of said bore in the direction of flow of particulate material through said bore;

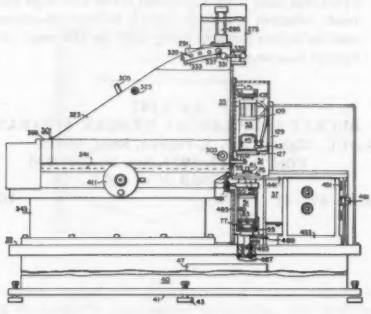
a pair of guide surfaces each arranged in the path of the liquid jet from a respective one of said nozzles and symmetrically positioned relative to said axis of said bore, each guide surface being formed on an external surface of said body and having a part-cylindrical shape, the axes of the cylinders of said guide surfaces being parallel and perpendicular to said axis of said bore and disposed in a plane downstream of said opening of said bore, the central diametral plane of each part-cylindrical surface including said axis of the respective one of said nozzles, each said guide surface being so positioned relative to the respective nozzle that the jet issuing from said respective nozzle will impinge tangentially on said guide surface and said liquid jets will be flattened by said guide surfaces and will converge to intersect along a line parallel to said axes of said cylinders and on said axis of said bore to flatten the jet of particulate abrasive material issuing from said bore.

3,972,151

METHOD AND APPARATUS FOR SHAPING TUNGSTEN-CARBIDE BLANKS

Harry J. Armitage, 1546 Cavitt Road, Monroeville, Pa. 15146

Continuation-in-part of Ser. No. 409,314, Oct. 24, 1973, Pat. No. 3,892,090. This application Apr. 7, 1975, Ser. No. 565,667
Int. Cl.² B24B 1/00, 5/16
U.S. Cl. 51—50 PC 8 Claims



1. Apparatus for shaping work in the form of a plurality of blanks of the tungsten-carbide type whose edges are to be ground including means for mounting a stack of said blanks with their edges to be ground extending vertically, said mounting means including vertically extending head-stock and tail-stock for clamping the stack of blanks between them with said edges exposed, a grinding wheel having a periphery of substantially smaller width than the height of said stack engaging said edges, means for moving said grinding wheel vertically along said stack with said periphery in grinding engagement with said edges, and means for controlling the relative positions of said edges and said grinding wheel.

3,972,152

BAND-TYPE POLISHER

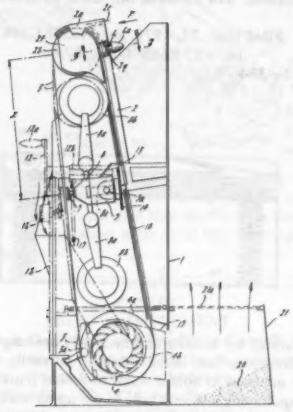
Robert Faure, c/o Cabinet Beau de Lomonie 14, Rue Raphail, 13 Marseille 8er, France

Filed Oct. 29, 1974, Ser. No. 518,763

Claims priority, application France, May 10, 1974, 74.17147

Int. Cl.² B24B 21/12

U.S. Cl. 51—141 14 Claims



14. A polisher utilizing a continuous abrasive band comprising:

a drive wheel adapted to be driven by a drive motor;

a freely rotatable driven wheel;

a support for said driving and said driven wheel;

a rotatable member mounted to rotate about a shaft disposed in a plane passing approximately through the longitudinal axis of the band and disposed so as to turn between said driving and driven wheels and between the facing non-abrasive sides of the band; and

a plurality of freely rotatable contact wheels carried by said rotatable member and mounted to rotate freely in such a manner that the axis of rotation of said contact wheels is disposed perpendicular to the axis of rotation of said rotatable member.

3,972,153

PROCESS FOR PACKAGING GOODS IN A STEAM ATMOSPHERE

Folke Kiellarson, Barseback; Sven Roos, and Thomas Quist, both of Bjarred, all of Sweden, assignors to AB Akerlund & Rausing, Lund, Sweden

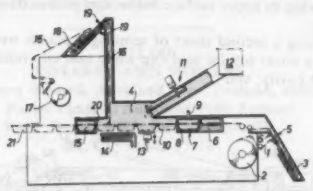
Filed Apr. 21, 1975, Ser. No. 569,612

Claims priority, application Sweden, Apr. 29, 1974, 7405699

Int. Cl.² B65B 31/02

U.S. Cl. 53—22 A 12 Claims

1. In a method of forming containers from a web of thermodeformable material and for filling and sealing said containers under aseptic conditions in an apparatus having a chamber in which forming, filling and sealing steps are carried out, the improvement comprising introducing steam at a super-atmospheric pressure into the chamber and onto a surface of the web for softening the web and for molding said web into a cup-shaped mold, said steam passing throughout said chamber to displace substantially all of the air therein and to maintain aseptic conditions during the forming, filling and sealing of the containers.



3,972,154

METHOD FOR STORING HEATED ASPHALT MIXTURE

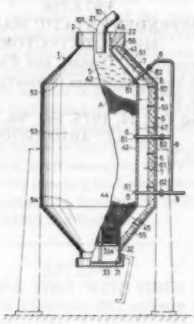
Toru Yoshikane, Nagoya; Kunihiko Kondo, Kasugai; Kazuya Otaki, Nagoya; Hiroyasu Funabashi, Kasugai; Toru Hasegawa, Kuwana, and Ichiro Yamada, Nagoya, all of Japan, assignors to Taiyu Doro Kensetsu Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 26, 1975, Ser. No. 562,045

Claims priority, application Japan, Mar. 28, 1974, 49-34952

Int. Cl.² B65B 55/00

U.S. Cl. 53—25 3 Claims



1. A method for storing a heated asphalt mixture, comprising the steps of:

injecting or charging superheated steam maintained at a temperature of about 150°C under the pressure of 0.1 to 0.01 kg/cm² and an asphalt mixture into a container, which is thermally insulated, to thereby displace air within said container by said superheated steam; and

closing said container thereafter.

3,972,155

PACKAGING TECHNIQUES FOR SEMI-RIGID PACKAGES

Reid A. Mahaffy, Montclair, and Joel A. Hamilton, Englewood, both of N.J., assignors to Mahaffy & Harder Engineering Company, Totowa, N.J.

Division of Ser. No. 860,590, Sept. 24, 1969, Pat. No. 3,792,181. This application Aug. 1, 1973, Ser. No. 384,717

Int. Cl.² B65B 43/08

U.S. Cl. 53—30 R 4 Claims

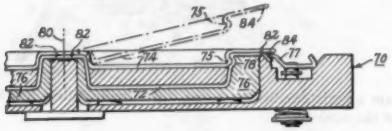
1. The method of packaging products comprising:

stretch-forming a first sheet of semi-rigid plastic into a die cavity having a surface irregularity in the inner surface of at least one side wall thereof, said first sheet conforming to the side walls of said die cavity including the surface irregularity, thereby to develop a semi-rigid plastic recep-

tacle cup with a side wall presenting a wall-surface irregularity corresponding to said die surface irregularity;

placing in said cup, while still in said die cavity, a product having its upper surface below said wall-surface irregularity;

applying a second sheet of semi-rigid plastic over said cup as a cover top for said cup while said cup remains in said die cavity; and



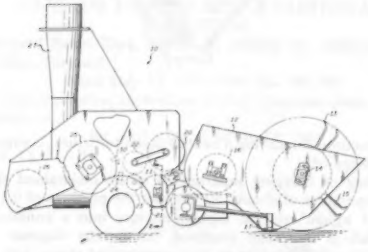
stretch-forming said second sheet into said cup down towards said product and out towards the side walls of said cup above said product, the outwardly-formed portions of said second sheet being conformed to the side walls of said cup above the product including the portion of said side walls presenting said wall-surface irregularity, thereby to develop in the outwardly-formed portions of said top an irregularity matching said wall surface irregularity of said cup and adapted to cooperate therewith to provide positive reclosure after the package has been opened.

3,972,156

SPEED-INDEPENDENT STATIC MAGNETIC FIELD METAL DETECTOR

Clarence L. Bennett, Jr., Groton, and Carl E. Bohman, Sudbury, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 24, 1975, Ser. No. 552,387
Int. Cl.² A01D *69/10*
U.S. Cl. 56—10.2 **10 Claims**



1. In a static magnetic field detector for protecting rotatable machine elements in harvesting machine that are susceptible to damage by tramp metal, said detector having means for generating a magnetic field and at least one magnetic pickup coil means, apparatus comprising:

lowpass filter means coupled to the output of said pickup coil means and having an attenuation characteristic with a slope substantially equal and opposite to the slope characteristic of the fluctuations in the output signal from the pickup coil means due to variations in the angular velocities of the rotatable machine elements, such that the amplitude of the output signal from said lowpass filter means is maintained substantially constant with respect to said fluctuations in the angular velocities of said rotatable machine elements;

bandpass circuit means coupled to said filter means and adjusted to pass the range of signals within a predetermined frequency spectrum for attenuating the response of said pickup coil means to spurious magnetic field variations due to said rotating machine elements and other sources without said predetermined frequency spectrum; and

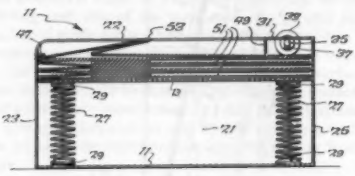
utilization means, coupled to said bandpass circuit means, and responsive to signals indicative of the presence of tramp metal, for stopping the operation of said machine and alerting the operator thereto.

3,972,157

BAG HOLDING AND OPENING APPARATUS

Sanford Meyers, 340 Croaton St., Lake Ronkonkoma, N.Y. 11779

Filed Mar. 24, 1975, Ser. No. 561,296
Int. Cl.² B65B *43/26, 67/00*
U.S. Cl. 53—384 **5 Claims**



1. Apparatus for holding and manually opening folded bags which comprises: an independently portable, rectangular container adapted to hold a stack of folded paper bags, each of said bags having a thumb hole in the upper wall thereof and being folded with the bag bottom on the upper surface thereof, said container permitting manual removal of the top bag from said stack; a platform resiliently mounted in said container for vertical movement therein adapted to support said stack of bags, means at the ends of said container for restraining said stack of bags from upward movement, said means at one end of said container comprising a transverse inwardly projecting flange adapted to engage the closed end of the top bag in said stack and said means at the other end of said container comprising a roller carried by said container adapted to engage the top bag on said stack at a point thereon aligned with the thumb hole in said bag and adjacent the open end thereof, whereby the top bag on said stack may be disengaged from said flange, opened, and removed empty from said container, by grasping the folded bottom thereof and pulling it longitudinally away from said roller.

3,972,158

VEGETATION CLEANING UNIT

Stig Lindström, Osterjorn, Sweden, assignor to Jorns Mekan AB, Jorn, Sweden

Filed Nov. 19, 1974, Ser. No. 525,128
Int. Cl.² A01D *55/26*
U.S. Cl. 56—13.6 **6 Claims**

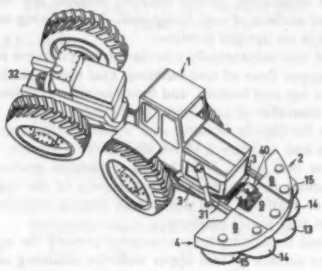
1. Apparatus for attachment to and propulsion by a vehicle to cut vegetation particularly shrubs and small trees, said apparatus comprising:

a housing,

a plurality of generally planar circular toothed cutting members,

means supporting said cutting members on the underside of said housing in a generally horizontal plane and with the forward edge of each cutting member in the forward direction of movement of the apparatus extending forwardly of said housing, said supporting means so supporting said plurality of cutting members that their toothed cutting edges which extend forwardly of said housing jointly form an unbroken cutting line,

and means for rotating each of said cutting members, said rotating means rotating those cutting members whose rotational axis lie to the left side of a center line of the apparatus in a counterclockwise direction and those



cutting members which lie to the right of the center line in a clockwise direction so that said cutters tend to convey the cut vegetation away from the center portion of the apparatus.

3,972,159

MOWING IMPLEMENT

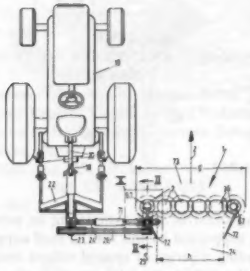
Pieter Adriaan Oosterling, and Hendricus Cornelis van Staveren, both of Nieuw-Vennep, Netherlands, assignors to Multinorm B.V., Nieuw-Vennep, Netherlands

Filed Dec. 27, 1974, Ser. No. 536,741

Claims priority, application Netherlands, Dec. 28, 1973, 7317824

Int. Cl.² A01D *57/30*

U.S. Cl. 56—192 **17 Claims**



1. In a mowing implement of the type including an elongate housing extending transversely of the direction of travel of the implement, a plurality of rotary members carried by said housing in closely overlying relation thereto, said cutting members having overlapping cutting paths whereby the implement is adapted to cut a swath Of standing crop, and drive means within said housing interconnecting said cutting members for effecting simultaneous rotation thereof, the combination of:

support means connected to said housing substantially wholly within the confines of a cut swath for supporting said housing from a powered vehicle;

at least one end of said implement being provided with drive input means carried by said support means for rotatably driving one of said rotary cutting members, said drive input means including an upstanding shaft drivingly connected to and extending upwardly with respect to said one rotary cutting member; and

an upstanding drum supported by and extending upwardly from said one rotary cutting member in surrounding relation to said upright shaft.

3,972,160

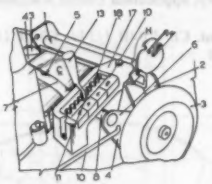
ROTARY LAWN MOWERS

Gordon Henry Boswell, Auckland, New Zealand, assignor to Mason & Porter Limited, Auckland, New Zealand

Filed Apr. 1, 1975, Ser. No. 564,050

Int. Cl.² A01D *55/18*

U.S. Cl. 56—255 **5 Claims**



1. In a mowing device, comprising a vehicular body for running on the ground and for supporting a motor-driven, rotary cutter, the body including a housing for the rotary cutter, said housing have a substantially open-bottom, rearwardly-opening raised discharge chute for connection with a rearwardly-disposed grass catcher, rear wheel mountings pivotally connected to opposite sides of the mower body, each rear wheel mounting journaling a wheel thereon; and an elongated, interconnecting means between said rear wheel mountings and above said housing, said interconnecting means being bent along its length so that a part of said interconnecting means passes above said raised discharge chute and another part of said interconnecting means is disposed at a lower position; and control means connected to said interconnecting means for rotating said interconnecting means in an arc above said discharge chute for pivoting said wheel mountings on said mower body for adjusting the housing vertically with respect to the ground over which the body runs.

3,972,161

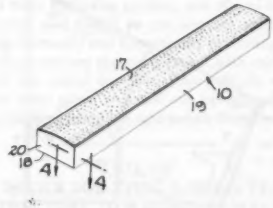
SOLID ABRADING TOOL WITH FIBER ABRASIVE

Melvin Howard Zoiss, Oaklawn, Ill., assignor to Barnes Drill Co., Rockford, Ill.

Continuation-in-part of Ser. No. 741,718, July 1, 1968, abandoned. This application Oct. 16, 1969, Ser. No. 868,976

Int. Cl.² B24D *3/00*

U.S. Cl. 51—206 R **4 Claims**



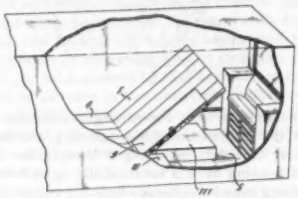
1. A superindurate composite cutting and abrading material for application to very hard substances, comprising in combination:

a. a matrix material having the characteristics of toughness and a uniform wearability less than the abrading elements embedded therein:

b. a plurality of superindurate filaments having a hardness on the Mohs' scale of 9.3 to 9.6 aligned substantially normal to a work surface defined by said matrix and

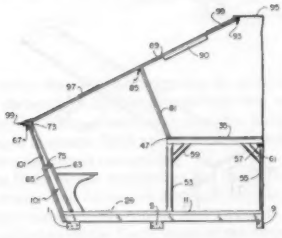
collocated within said matrix the ends of substantially the major portion of said filaments exposed on said surface to define a cutting edge of abrading surface upon said composite, the remainder of the length of said filaments embedded in said matrix.

3,972,162
BUILDING MODULES
Thomas Maldwyn Lewis, Knights Enham, near Andover, England, assignor to Vagabond Films Establishment, Vaduz, Liechtenstein
Filed Oct. 20, 1975, Ser. No. 624,222
Claims priority, application United Kingdom, Oct. 23, 1974, 45888/74
Int. Cl.² E04B 1/344; E04H 1/12
U.S. Cl. 52—69 6 Claims



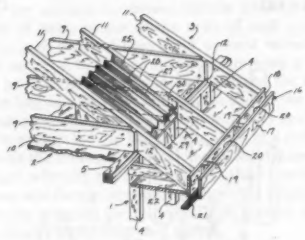
1. A domestic room module consisting essentially of
a. fixed wall structures enclosing a lower floor and an upper floor, the said upper floor being spaced from the lower floor at a height not exceeding one-third of the height of the wall structures,
b. a portion of the said upper floor rotatable about a horizontal axis to form in a horizontal position an upper floor portion of the module and in a vertical position to form a wall dividing the room and whereby in the vertical position a portion of the lower floor is exposed, and
c. drive means to effect the said rotation of the said portion of the said rotatable upper floor portion.

3,972,163
CONCENTRIC BUILDING
William S. Coperthwaite, Bucks Harbor, Maine 04618
Filed Oct. 11, 1974, Ser. No. 514,127
Int. Cl.² E04B 1/32
U.S. Cl. 52—82 20 Claims



1. A concentric building comprising:
means for a foundation which includes a plurality of first solid footings arranged into an outer circle, a plurality of second solid footings arranged into an inner circle within and concentric with said outer circle of first footings, and a single solid footing located at the center of said concentric circles of first and second solid footings;
a substantially circular lower platform having a bottom resting upon said foundation means, and a top serving as a lower floor of said building;
a lower wall having a bottom portion rigidly attached to the outer circumference of said lower platform, said lower wall sloping outwardly away from said lower platform;
a first tensioning means secured around the uppermost outer surface of said lower wall, for retaining said lower wall in an upright position;
at least one substantially circular upper platform serving as an upper floor of said building, said upper platform having a top and bottom, and being smaller in diameter than the diameter of said lower platform;
means for rigidly holding said upper platform concentric with and a distance above said lower platform;
at least one upper wall having a bottom portion rigidly attached to the outer circumference of the top of said upper platform, said upper wall sloping outwardly away from said upper platform;
a second tensioning means secured around the uppermost outer surface of said upper wall, for retaining said upper wall in an upright position;
a door hingedly mounted within a doorway out through said lower wall;
means for providing a roof rigidly connected to the top edges of said lower and upper walls; and
means for providing an entranceway between siad upper and lower platforms.

3,972,164
ROOF CONSTRUCTION WITH INLET AND OUTLET VENTING MEANS
Howard L. Grange, P.O. Box E, Darlington, Wis. 53530
Filed Mar. 11, 1974, Ser. No. 449,977
Int. Cl.² E04B 7/18
U.S. Cl. 52—95 6 Claims

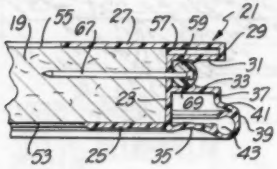


1. A building construction, comprising an exterior vertical wall, a ceiling supported by the wall, a roof supported by the wall and including a series of spaced rafters and a roof deck supported by the rafters, air inlet means in the roof and disposed outwardly of the exterior wall, air outlet means in said roof and disposed inwardly of the exterior wall, insulating means supported by the ceiling, an insulating member located between adjacent rafters, each insulating member having a lower surface resting on the ceiling and having an upwardly and inwardly extending inclined upper surface bearing against the undersurface of the roof deck and having an inner end surface connecting the inner end of the lower surface and the inner end of said inclined surface, said insulating means abutting said inner end surface channel means in said member adjacent said upper surface and defining a series of channels for the flow of air along the undersurface of the roof deck in a direction from said air inlet means to the air outlet means, and flange means disposed on the outer end of said insulating member and extending downwardly from said lower surface, said flange means disposed in engagement with the outer surface of said exterior wall to position the insulating member longitudinally between said adjacent rafters.

3,972,165
SURROUND MOLDING WITH FASTENER CONCEALMENT MEMBER FOR USE ON PARTICLE BOARD DOORS

Donald E. Mock, Covina, Calif., assignor to Reed Irrigation Systems, El Monte, Calif.

Filed Nov. 14, 1975, Ser. No. 631,950
Int. Cl.² E04C 2/10, 2/38
U.S. Cl. 52—309 12 Claims

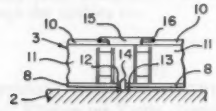


1. A molding for a panel comprising:
wall means for defining an elongated channel, said channel opening in a first direction and being adapted to receive an elongated peripheral portion of the panel;
first means on said wall means for defining a recess, said recess opening in a second direction, said first and second directions being different;
a portion of said wall means lying between the interior of said channel and the interior of said recess; and
a fastener concealment member in said recess, said fastener concealment member being softer than said wall means and having a rigid outer surface, said rigid outer surface being penetrable by a fastener and the head of the fastener whereby with the molding on the panel the fastener can be driven through the fastener concealment member and said portion of said wall means into the panel with the fastener concealment member at least partially concealing the head of the fastener.

3,972,166
HEAT INSULATION STRUCTURE FOR LIQUEFIED GAS STORAGE TANK

Taizo Shimomura, Yokohama; Hitoshi Saito, Zushi; Minoru Sueyoshi, and Hiroshi Tsuda, both of Yokohama, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1974, Ser. No. 500,180
Int. Cl.² B65D 25/18
U.S. Cl. 52—404 3 Claims

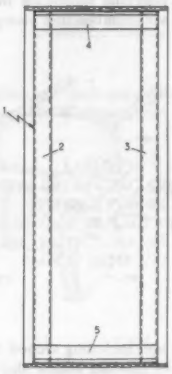


1. A heat insulation structure for a liquified gas storage tank comprising a plurality of heat insulation sandwich structure units attached to the outer shell of said storage tank, each sandwich structure unit comprising a plurality of joists arrayed in spaced apart relation and sandwiched by top and bottom plate members made of wood, and heat insulating materials filled in the spaces defined by said joists and said plate members, each joist comprising a pair of sheet members made of wood, and spaced apart from each other by spacers of wood by a predetermined distance, and insulating materials filled into the space defined by said pair of sheet members and spacers, and wherein the outer tank shell is provided with members against which the side edges of said bottom plate members of said sandwich structure units are pressed for the transmission of shearing forces.

3,972,167
WALL SYSTEM OF TWO PARALLEL SPACED PANELS

Ernst Vögeli, Zurich, Switzerland, assignor to Polio Establishment Vaduz, Liechtenstein

Filed Feb. 11, 1974, Ser. No. 441,332
Claims priority, application Switzerland, Feb. 10, 1973, 1921/73
Int. Cl.² E04B 2/28, 2/74
U.S. Cl. 52—481 14 Claims



1. In a wall system, a composite wall element comprising two substantially parallel transversely spaced panels; a frame including two upright supports disposed with clearances between said panels, and connecting bars interconnecting said upright supports, each panel being separated by a gap from the respective one of said connecting bars; means for supporting one of said panels only on one of said upright supports and the other panel only on the other upright support; means for attaching a respective panel to said frame, including a first mounting section attached to said frame in region of one of said connecting bars; a second mounting section attached to said respective panel and supported on said first mounting section, a third mounting section attached to said respective panel, and a fourth mounting section mounted on said frame in the region of the other connecting bar for movement between an extended position in which it is disengaged from said third mounting section and a retracted position in which it engages said third mounting section; and means for mechanically connecting said panels to one another, said connecting means having thermally and acoustically insulating properties, whereby said connecting means, together with said clearances between said one panel and said other upright support and between said other panel and said one upright support, thermally and acoustically insulate said panels from one another.

3,972,168
TYING DEVICE FOR TYING A WOOD FRAMING STRUCTURE TO A MASONRY WALL

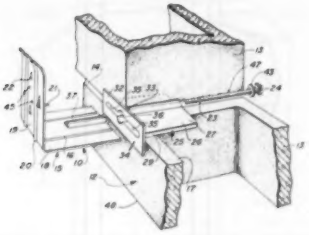
George E. Allen, 15513 S. Dobson, Dolton, Ill. 60419

Filed Nov. 8, 1974, Ser. No. 522,010
Int. Cl.² E04C 5/18
U.S. Cl. 52—698 17 Claims

1. A tying device for tying a structural member of a wood framing structure to a masonry wall which includes a wall body having a vertically extending outer wall surface and including masonry wall units having horizontally extending upper and lower wall surfaces and vertically and horizontally

extending mortar joints between the said masonry wall units comprising:

a. a combination clamping and fastening unit including a base plate member having
   1. an inner end; and
   2. an outer end; the said base plate member having
   3. a clamping flange member at the outer end thereof and projecting generally right-angularly and vertically upwardly therefrom;
b. a sleeve unit including
   1. a hollow sleeve member adapted to be disposed in and to lie horizontally within one of the said horizontally extending mortar joints in the said wall body of the said masonry wall; the said combination clamping and fastening unit including
c. first threaded fastening means on the said base plate member of the said combination clamping and fastening unit;



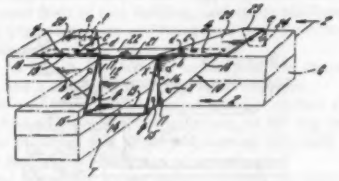
d. the said sleeve unit including second threaded fastening means carried by the said hollow sleeve member of the said hollow sleeve unit and adapted to be threaded into coacting threaded engagement with the said first threaded fastening means to draw the said clamping flange member on the said base plate member into claping engagement with the said structural member of the said wood framing structure; the said hollow sleeve member of said sleeve unit including
e. a substantially flat bottom surface adapted to rest on the horizontal wall surface of one of the said masonry wall units; and
f. the said hollow sleeve member of the said sleeve unit including
   1. a raised horizontally extending central portion which is adapted to project into and to be anchored in one of the said vertically extending mortar joints of the said masonry wall.

3,972,169
SADDLE HANGER

Isaac Sheppard, Jr., 1030 W. Elmwood St., Clawson, Mich. 48017

Filed Jan. 12, 1976, Ser. No. 648,008
Int. Cl.² E04C *3/02*
U.S. Cl. 52—702 **10 Claims**

1. A one-piece sheet metal saddle hanger for supporting an end of a building component or the like, comprising: substantially triangular front panel with a stirrup seat joined thereto along a first crease line which truncates said front panel, said stirrup seat adapted to project perpendicularly from said front panel when bent along said first crease line, a pair of substantially right triangular stirrup sides each joined at its base to one side of said stirrup seat along a second crease line and each adapted to project at mutually different right angles from both said front panel and said stirrup seat when bent along said second crease line, a pair of substantially right triangular side saddle portions each joined along one leg to the leg of one of said stirrup sides along a third crease line and adapted to project at a right angle to said stirrup side and to overlie a portion of said front panel in substantially coplanar relation when bent along said third crease line, and a pair of truncated, substantially right triangular top saddle portions each joined at its base to the base of one of said side saddle portions along

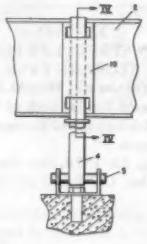


a fourth crease line and adapted to project perpendicularly to said front panel and in the opposite direction therefrom relative to said stirrup seat when bent along said fourth crease line.

3,972,170
REINFORCING MEMBER FOR SPACED FLANGES OF A FRAME MEMBER

Robert C. Brammer, 336 W. 7th St., Traverse City, Mich. 49684

Filed May 23, 1974, Ser. No. 472,857
Int. Cl.² E04H *9/14*
U.S. Cl. 52—750 **7 Claims**



6. Reinforcing apparatus for the reinforcement of frames for mobile homes or the like comprising a mobile home, trailer, or the like having at least one frame member for support thereof, said frame member including a central support member and a pair of spaced flanges extending to at least one side of said central member and forming a channel therebetween; a rigid, reinforcing member extending between said flanges and across said channel with its ends abutting the inside surfaces of said flanges, said reinforcing member being spaced from said central support member adjacent the outer ends of said spaced flanges for supporting said flanges and preventing them from collapsing toward one another when said frame member is secured to a ground anchor.

3,972,171
HOUSING CONSTRUCTION FOR OPEN END SPINNING MACHINES

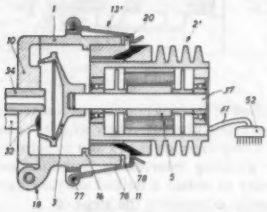
Karl Handschuch, Oberhaunstadt, and Heinrich Niestroj, Ingolstadt, both of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Germany

Continuation of Ser. No. 264,598, June 20, 1972, abandoned. This application Oct. 7, 1974, Ser. No. 512,859

Claims priority, application Germany, June 21, 1971, 2130688

Int. Cl.² D01H 1/12

U.S. Cl. 57—58.89 **2 Claims**



1. In an open-end spinning machine having a spinning turbine including a spinning shaft, a tubular housing receiving the spinning turbine, a cover on one end of the housing including a fiber-supply channel connecting a fiber-resolving device externally of the housing and the housing interior, and a yarn drawoff tube in the cover, the housing having an open end remote from the cover, the diameter of said opening being greater than the diameter of the spinning turbine, said housing further having a first portion adjacent to the cover receiving the spinning turbine and a second portion remote from said cover and connected to said first portion, a bearing sleeve having bearings for the spinning shaft and fitting into said open housing end and embraced by said second portion, and tightening means carried on such second portion, the improvement comprising an adapter bushing interposed between said second housing portion and the bearing sleeve and being secured in said second portion of said housing by said tightening means, said bushing having an axial slit through its wall extending the entire length of such wall, and an individual commutator direct current motor for driving the spinning shaft, said bushing further having a circumferential flange on one end exteriorly of the open housing end, and an electronic motor control container carried by an arcuate portion of said adapter bushing flange at one side of the flange diametral line passing through the bushing slit.

3,972,172
SPINNING ROTOR CONSTRUCTION

Jean Waleckx, Villebon-sur-Yvette, France, assignor to SKF Compagnie d'Applications Mecaniques, Clamart, France

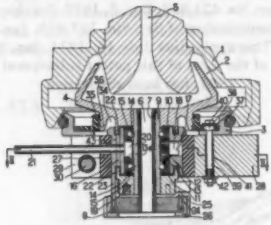
Filed Mar. 11, 1975, Ser. No. 557,383

Claims priority, application France, Mar. 14, 1975, 75.08654

Int. Cl.² D01H 1/12

U.S. Cl. 57—58.89 **9 Claims**

1. A spinning rotor for free fibers having axial fiber extraction, said rotor comprising a hollow rotatable shaft provided with two spaced external annular grooves, two rings of balls mounted in cylindrical cages, said balls being rotatably disposed in said grooves, fixed exterior rings having oblique contact surfaces engaged with said balls, a bearing member having a bore receiving said exterior rings, bracing means in said bore maintaining said exterior rings in said bore in spaced relation, and means for axially and rotatably immobilizing said bracing means, which bracing means comprises a U-shaped



cross-piece encircling said shaft and an elastic washer between said cross-piece and one of said exterior rings.

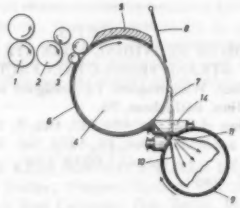
3,972,173
APPARATUS FOR PRODUCING SPUN YARN FROM TEXTILE FIBERS

Ernst Fehrer, Auf der Gugl, 28, Linz, Austria

Filed Apr. 10, 1975, Ser. No. 566,992

Int. Cl.² D01H 1/12

U.S. Cl. 57—58.89 **2 Claims**



1. Apparatus for producing spun yarn from textile fibers, comprising

a suction drum having a horizontal axis and being operable to rotate in a predetermined direction about said axis,

means operable to form on the periphery of said suction drum a suction zone which is angularly spaced by an acute angle from the zenith of said drum in a direction which is opposite to said predetermined direction, said suction zone having a sharply defined edge adjacent to said zenith,

a disintegrating unit operable to disintegrate feed material into individual fibers and to release said fibers to fly off freely and to be scattered and impinge on said suction drum throughout said suction zone,

whereby said fibers which have impinged on said suction drum in said suction zone are twisted together to form a yarn tail and are subsequently spun to form a yarn under the action of components of force which are due to the rotation of said suction drum and the suction in said suction zone,

the width of said suction zone, measured in said predetermined direction, being equal to the diameter of said yarn tail, and

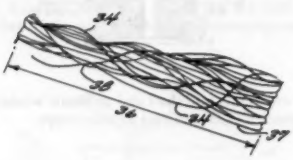
draw-off means disposed adjacent to and axially spaced from one end of said suction drum and operable to draw off said yarn from said suction zone parallel to the axis of said drum.

3,972,174

TEXTURED YARN AND FABRIC

Joe F. London, Jr., Greensboro, N.C., and Jean-Louis Lauber, Munchenstein, Switzerland, assignors to Burlington Industries, Inc., Greensboro, N.C.

Division of Ser. No. 421,850, Dec. 5, 1973, Pat. No. 3,911,655, which is a continuation of Ser. No. 217,059, Jan. 11, 1972, abandoned. This application July 18, 1974, Ser. No. 489,724
The portion of the term of this patent subsequent to July 23, 1991, has been disclaimed.
Int. Cl.² D02G 3/34
U.S. Cl. 57—140 J 6 Claims



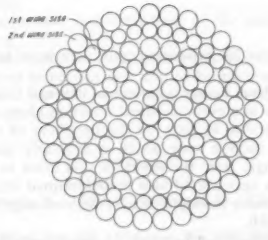
1. A textured, air jet interlaced yarn comprising a plurality of continuous synthetic thermoplastic filaments, said yarn being characterized by uniform repeating sections of about ⅛–1 inch in length, each said section being composed of a relatively open bulky and lofty portion of flase twisted multifilaments and a relatively short node portion where the multifilaments are closer together and are interlaced and encircled.

3,972,175

METHOD OF PROVIDING WIRE STRAND FROM A STRAND PRODUCTION FACILITY

Carl D. Hiller, Williamsport, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation of Ser. No. 404,587, Oct. 9, 1973, abandoned. This application Dec. 10, 1974, Ser. No. 531,270
Int. Cl.² D07B 1/06
U.S. Cl. 57—145 4 Claims



1. A wire strand having a diameter range from 1 inch to 5½ inches in which range the difference in diameters between any two successive strands is a constant and said wire strand is formed from no more than three wire sizes which include:

a. a first wire;

b. a second wire with a size smaller than said first wire;

c. a third wire with a size which is:

i. smaller than said second wire by one-half the constant difference in diameters between successive strands, and

ii. equal to 75% of the size of said second wire, and

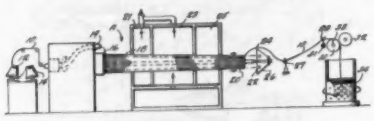
d. said wires are arranged according to the construction set forth in Table I of the specification, whereby said three wire sizes allow all sizes of strand within said diameter range to be manufactured.

3,972,176

METHOD OF TREATING SYNTHETIC YARNS

John C. Lawson, Jr., Washington, and Chester A. Williams, Lake Waccamaw, both of N.C., assignors to National Spinning Company, Inc., New York, N.Y.

Continuation of Ser. No. 359,124, May 10, 1973, abandoned. This application Oct. 3, 1974, Ser. No. 511,937
Int. Cl.² D02J 1/12
U.S. Cl. 57—157 TS 10 Claims



10. A method of treating continuous filament synthetic yarn having latent crimp characteristics so as to substantially fully develop its crimp characteristics and to subsequently set the yarn while avoiding intervening deterioration of manifest crimp in order to obtain a bulked set yarn having improved covering power, comprising the steps of:

placing a lightly twisted synthetic textile yarn having pre-existing latent crimp and shrinkage characteristics on a rotating support in closely spaced, substantially uncompacted coils;

passing said twisted yarn on said support through a first moist heat treatment zone under conditions of temperature and moisture sufficient to render manifest the said latent crimp characteristics, but without permanently setting manifest characteristics in the yarn;

continuously maintaining said yarn under substantially tensionless conditions within said treatment zone so as to permit substantially all of the latent crimp characteristics of the yarn to become manifest;

withdrawing said yarn from said rotating support under correlated conditions of yarn travel so as to apply only minimum tension to the yarn for a duration of a fraction of one second;

relieving all tension on said yarn and depositing said yarn in successive treatment containers so as to form within each of said containers a low-density, uncompacted mass of yarn in a configuration having bends throughout the length of the yarn within said container at intervals of less than the width of said container; and

further treating said yarn in said treatment containers under moist temperature conditions higher than the said first zone so as to substantially permanently set said manifest crimp characteristics in said yarn, to substantially permanently set said twist in said yarn, and to substantially permanently set said bends in said yarn.

3,972,177

CONTROL MECHANISM FOR TIME SETTING AND SIMILAR FUNCTIONS

Cyril Vuilleumier, Bienne, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Switzerland

Filed Apr. 2, 1975, Ser. No. 564,467
Claims priority, application Switzerland, Apr. 8, 1974, 4908/74
Int. Cl.² G04B 27/02
U.S. Cl. 58—63 8 Claims

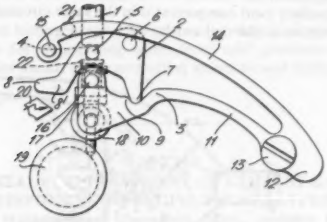
1. A timepiece comprising a stem control mechanism capable of assuming at least two operative positions on either side of a neutral position, thereby to effect time setting, said control mechanism including:

a rotatable trigger piece, said trigger piece forming at least one protruding beak;

a stem actuatable from the exterior of the timepiece to be moved axially between said neutral and said at least two operative positions;

a linking means for mechanically linking said stem and said trigger piece to thereby rotate said trigger piece when said stem is moved axially;

a setting wheel mechanism linked to said stem for setting the time indication of said time piece when said setting wheel is in an operative position in response to rotation of said stem; and



a resilient elongated setting lever having a pivot at a first end thereof and being mechanically linkable to said setting wheel mechanism at an opposite end thereof, said setting lever being biased from its pivot along its resilient length to urge said opposite end against said at least one protruding beak of said trigger piece for moving said setting wheel to said operative position in response to rotation of said trigger piece, said elongated setting lever having a contour for meshing with said at least one beak to hold said trigger piece in stable positions.

3,972,178

ELECTRICALLY POWERED TIMEPIECE

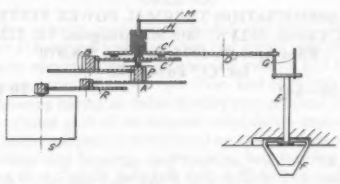
Pierre-Andre Beguin, Nods, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Switzerland

Filed Oct. 2, 1973, Ser. No. 402,754

Claims priority, application United Kingdom, Oct. 13, 1972, 4705/72

Int. Cl.² G04B *27/08*

U.S. Cl. 58—85.5 **9 Claims**



1. In an electrically powered timepiece having at least a minute hand indicator and an hour hand indicator and which comprises a high precision time standard, a stepping motor to drive said indicators, and a frequency divider responsive to the time standard for driving the stepping motor, the improvement comprising:

a positive drive means connecting the motor to the minute hand indicator, an hour hand correcting mechanism, a non-positive drive means connecting the hour hand indicator to the minute hand indicator, whereby the position of the hour hand indicator may be altered without perturbing the minute hand setting or the continued operation of the motor, said frequency divider producing output pulses at a frequency of less than 1 Hz to drive said motor to thereby advance the minute hand indicator by steps representing more than one second.

3,972,179

CHANGEABLE DISPLAY DEVICE

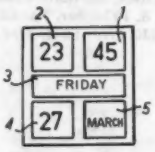
Pierre Bodet, 49340 Trementines, France

Filed Mar. 28, 1975, Ser. No. 562,839

Claims priority, application France, Mar. 28, 1974, 74.10730

Int. Cl.² G04B *27/08*

U.S. Cl. 58—85.5 **5 Claims**



1. A horological instrument that displays a plurality of time units of different lengths, comprising a plurality of modules each adapted to display a different one of said time intervals, motor means for automatically driving a first of said modules, means for driving the other said modules each from another module, each said module comprising a drive shaft individual to said module, a plurality of said drive shafts of different said modules being spaced apart and parallel to each other, a chassis supporting said modules, and a knob on each of said plurality of shafts of said other modules, said knobs being disposed outside said chassis and being rotatable by the fingers of an operator thereby manually selectively to adjust the display of each of said other modules associated with one of said plurality of shafts without interrupting said automatic drive and without changing the display of the other said modules.

3,972,180

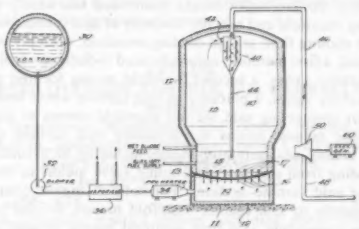
HIGH PRESSURE REACTOR WITH TURBO EXPANDER

Louis Ralph Van Gelder, Western Springs, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Sept. 21, 1971, Ser. No. 182,377

Int. Cl.² F02C *3/24*; F22B *1/22*

U.S. Cl. 60—39.05 **13 Claims**



1. Apparatus comprising:

a combustion vessel adapted to operate at pressures exceeding 15 psig and temperatures exceeding 1200°F.;

a body of inert granular material adapted to be fluidized and maintained in vessel;

a feed means for supplying a high moisture waste containing combustible organic waste matter to the vessel under pressure at a controllable rate;

a gas supply means for supplying oxygen containing gas to said vessel for fluidizing said granular material in said vessel;

a gas exhaust means for exhausting gas under pressure from said vessel;

a turbo expander in fluid communication with said exhaust means, whereby said exhaust gas drives said turbo expander; and

means in operable communication with the turbo expander to be driven thereby.

3,972,181

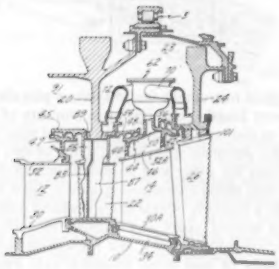
TURBINE COOLING AIR REGULATION

Kenny M. Swayne, North Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 8, 1974, Ser. No. 449,583

Int. Cl.² F02C *7/18*; **F01D** *5/14, 5/18*

U.S. Cl. 60—39.66 **10 Claims**



1. In a gas turbine engine having a compressor, a combustion section, and a turbine section, said turbine section having a turbine rotor mounted for rotation with turbine blades mounted therearound, a cooling manifold being located rearwardly of said turbine rotor and inwardly of said turbine blades, turbine vanes located in said turbine section rearwardly of said turbine blades, said cooling manifold having first opening means at its outer periphery, said turbine rotor having second opening means connected to the interior of said blades, said outer periphery of said cooling manifold having sealing cooperation around its first opening means with the second opening means of said turbine rotor, said first opening means and said second opening means being radially aligned, a plurality of said turbine blades having openings therein connecting the interior of said blades to the exterior thereof, a turbine cooling valve means positioned rearwardly of said cooling manifold and radially inwardly of said turbine vanes to direct cooling fluid to said cooling manifold, a supply of cooling fluid, a first manifold means located radially inwardly from the turbine vanes, a second manifold means located around the turbine vanes, a plurality of said turbine vanes being hollow for connecting said second manifold means to said first manifold means, means for actuating said turbine cooling valve means, said actuating means including an actuating rod extending from said turbine cooling valve means to the exterior of said turbine section, first conduit means connecting said supply to said second manifold means, second conduit means connecting said first manifold means to said turbine cooling valve means.

3,972,182

FUEL INJECTION APPARATUS

Enrico Salvi, Salem, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Sept. 10, 1973, Ser. No. 395,606

Int. Cl.² F02C *3/24, 7/22*

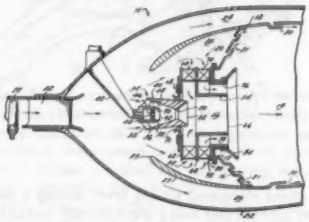
U.S. Cl. 60—39.74 R **10 Claims**

1. A fuel injection apparatus comprising:

a fuel injector having a cylindrical housing, a tubular body centrally disposed within the cylindrical housing and spaced apart therefrom so as to define a first annular air passage therebetween, fuel swirl means disposed within the tubular body for imparting a swirl to an inlet stream of fuel, and a plurality of circumferentially spaced apart struts disposed intermediate the tubular body and cylindrical housing;

a primary shroud generally coaxially spaced downstream from the fuel injector defining a central core air passage therethrough;

secondary air swirl means disposed intermediate the injector and primary shroud to impart a circumferential swirl component to the flow through the core wherein the secondary swirl component is in the same circumferential direction as the fuel swirl;



tertiary air swirl means disposed downstream of the secondary swirl means to impart a circumferential swirl component in the direction opposing that of the secondary swirl means, such that fuel reaching the downstream end of the primary shroud is atomized by the shear stresses developed by the counter-rotating aerodynamic forces at the confluence of the secondary and tertiary swirls; and

wherein the interior surface of the cylindrical housing downstream from the tubular body converges to a minimum diameter orifice and thereafter diverges outwardly, terminating in a transverse edge upstream of the primary shroud so as to generally define a venturi whereby fuel may be sheared from the transverse edge by the coaction of air flowing through the central core air passage and the vortical flow emanating from the secondary air swirl means into direct impingement on the interior surface of the primary shroud.

3,972,183

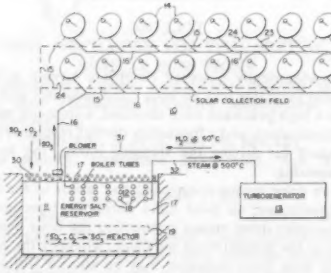
GAS DISSOCIATION THERMAL POWER SYSTEM

Talbot A. Chubb, 5023 N. 38th St., Arlington, Va. 22207

Filed Apr. 17, 1975, Ser. No. 568,970

Int. Cl.² F03G *7/00*

U.S. Cl. 60—641 **10 Claims**



1. A solar thermal power system for generating electrical energy, which comprises:

a solar energy collection field comprising a plurality of individual solar furnaces for chemical dissociation of a fluid into its chemical components;

a heat transfer heat storage reservoir including a heat transfer means therein;

means for transmission of said fluid chemical components from said solar furnaces to said heat transfer storage reservoir at a temperature below that at which dissociation occurred for recombination thereof into its original chemical state giving off heat;

means for transmission of said fluid back to said solar furnaces;

a boiler means in said reservoir for converting water into steam;

a steam turbogenerator for generating electrical energy; and

means for transmitting water from said generator to said boiler means and transmitting steam to said turbogenerator.

3,972,184

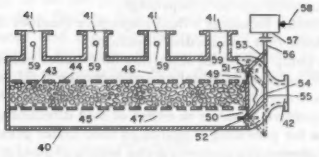
CATALYTIC TREATMENT OF EXHAUST GAS RESPONSIVE TO ENGINE TEMPERATURE

Joel A. Warren, West Bloomfield, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 245,730, April 20, 1972, abandoned. This application Oct. 25, 1974, Ser. No. 517,870

Int. Cl.² F01N *3/14*; **F02B** *75/10*

U.S. Cl. 60—288 **1 Claim**



1. An exhaust manifold catalytic converter adapted to contact exhaust gas with a catalyst bed during selected periods of engine operation and to by-pass said catalyst bed during the remaining period of engine operation, said converter comprising a housing having an exhaust entry port adapted to connect to an exhaust port of an internal combustion engine, an exhaust outlet adapted to connect to an exhaust pipe, a catalyst bed within said housing, said catalyst bed forming an entry plenum in the space between said catalyst bed and said exhaust entry port, said catalyst bed forming an exit plenum within said housing positioned on the opposite side of said catalyst bed from said entry plenum, said exit plenum communicating with said exhaust outlet through an exhaust passage, said entry plenum communicating with said exhaust outlet through a by-pass passage, a by-pass valve in said by-pass passage, an exhaust valve in said exhaust passage, valve interlock means such that when said by-pass valve is open said exhaust valve is closed and when said by-pass valve is closed said exhaust valve is open, valve actuating means operatively connected to said by-pass valve, said valve actuating means being responsive to engine temperature sensing means such that said by-pass valve is closed when said engine temperature is below a pre-determined level and opened when said engine temperature rises above a pre-determined level.

3,972,185

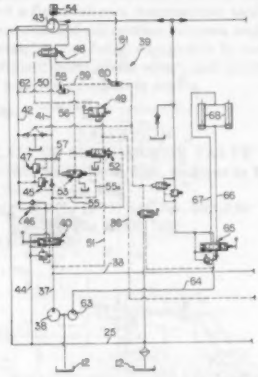
HYDRAULIC SYSTEM FOR A PIPELAYER

Glenn J. Medina, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 28, 1975, Ser. No. 554,256

Int. Cl.² F15B *13/09*

U.S. Cl. 60—421 **8 Claims**



1. A hydraulic system for a pipelayer having a boom and a winch powered by hydraulic motors comprising:

a boom control circuit including a first hydraulic motor, a first source of pressurized fluid and first control valve means operative for selectively directing fluid from said source for operation of said first motor;

a hoist control circuit including a second hydraulic motor, a second source of pressurized fluid and second control valve means for selectively directing pressurized fluid from said second source for operation of said second motor; and

control means including first pressure-responsive control means responsive to a first predetermined pressure to permit combining of fluid from said first source with fluid from said second source for high-speed operation of said second hydraulic motor, said control means including second pressure-responsive control means responsive to a second predetermined pressure to prevent said combining of fluid, wherein said second pressure-responsive control means includes a speed override control valve responsive to said second predetermined pressure to vent said first predetermined pressure.

3,972,186

SPEED OVERRIDE CONTROL FOR HYDRAULIC MOTORS

Rex T. Humphreys, Washington, and Glenn J. Medina, Joliet, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 28, 1975, Ser. No. 554,255

Int. Cl.² F16D *31/02*, *39/00*

U.S. Cl. 60—425 **7 Claims**

1. A hydraulic control system including speed override control means for rotary output radial piston hydraulic motors, comprising:

a primary source of pressurized fluid;

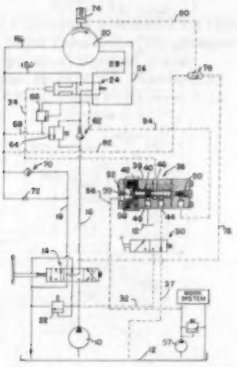
means including a directional control valve and conduit means for selectively directing fluid from said source to a reversible multi-speed hydraulic motor;

a pilot operated speed-control valve operative to selectively control the flow of fluid in said conduit means to thereby selectively control the speed of said motor wherein said speed-control valve is a two-position valve operative in a first position to direct pressure fluid sequentially to all of said pistons for low-speed high-torque operation, and

operative in a second position to direct pressure fluid to one-half of said pistons for high-speed operation; and

an override control valve responsive to fluid pressure in said conduit means to alter said pilot signal to override said speed-control valve;

a speed selector valve is operative to selectively control said speed-control valve by means of a pilot signal;



said conduit means includes a first conduit for directing said fluid to one side of said motor for operation of said motor in one direction and a second conduit for directing said fluid to the other side of said motor for reverse operation thereof; and

each of said first and second conduits includes a branch conduit controlled by said speed-control valve for controlling the speed of said motor.

3,972,187

HYDRAULIC TRANSMISSION

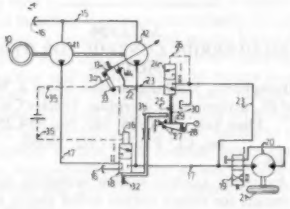
Günter Ital; Hans-Jürgen Fricke, both of Stuttgart, and Paul Bosch, Ludwigsburg, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Sept. 25, 1974, Ser. No. 509,340

Claims priority, application Germany, Sept. 26, 1973, 2348389

Int. Cl.² F15B *13/09*

U.S. Cl. 60—428 **10 Claims**



1. In combination, an hydraulic consumer; a first pump and a second pump having respective mechanical inputs and operative when said mechanical inputs are driven at constant speed for pumping fluid at an adjustable volumetric flow rate and at a constant non-adjustable volumetric flow rate, respectively, the maximum volumetric flow rate of said first pump being at least as great as that of said second pump; connecting means connecting said first pump in hydraulic circuit with said consumer; adjusting means for adjusting the volumetric flow rate of said first pump; and control means operative for bringing said second pump into and out of hydraulic circuit with said consumer in dependence upon the operation of said adjusting means.

3,972,188

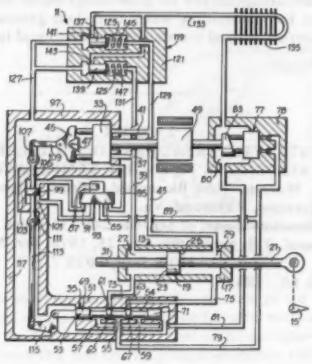
CONTROL SYSTEM WITH ACTUATOR POWERED BY DUAL SOURCES

James M. Jessee, Fountain Valley, Calif., assignor to Bertea Corporation, Irvine, Calif.

Filed Oct. 9, 1975, Ser. No. 621,090

Int. Cl.² F15B *15/18*; F16H *39/46*

U.S. Cl. 60—443 **16 Claims**



1. A control system comprising:

an actuator including a fluid responsive member movable in at least first and second directions;

servo pump means for supplying fluid under pressure to the fluid responsive member and receiving fluid under pressure from the fluid responsive member to move the fluid responsive member in either of said directions;

means for providing a source of fluid under pressure;

valve means for controlling the supply of fluid under pressure from said source to the fluid responsive member and the return of fluid from the fluid responsive member provide at least some control over the movement of the fluid responsive member whereby the servo pump means and the valve means cooperate to control the fluid responsive member; and

said servo pump means and said valve means being arranged so that the actuator receives the sum of the flows from the servo pump means and the valve means.

3,972,189

CONTROL FOR HYDROSTATIC TRANSMISSIONS

Kenneth K. Knapp; Charles R. Cornell, and Edwin D. Hicks, all of Battle Creek, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 17, 1975, Ser. No. 632,741

Int. Cl.² F16H *39/46*

U.S. Cl. 60—444 **6 Claims**

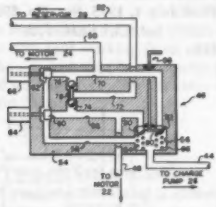
1. A control valve for a variable displacement pump or motor having an actuator for varying the displacement thereof, the actuator including first and second motors to increase the displacement of the pump or motor when the volume of fluid is increased in the first motor and decreased in the second motor and to decrease the displacement when the volume of fluid is decreased in the first motor and increased in the second motor, the pump or motor being usable in association with a relatively high pressure fluid source and a relatively low pressure fluid source, the control valve comprising:

A. a first passage adapted for communication with the first motor and the high pressure fluid source;

B. first seal means movable between one position to allow fluid to flow through the first passage from the high pressure fluid source to the first motor and another position to prevent fluid from flowing through the first passage from the high pressure fluid source to the first motor;

C. a second passage adapted for communication with the second motor and the high pressure fluid source;

D. second seal means movable between one position to allow fluid to flow through the second passage from the high pressure fluid source to the second motor and another position to prevent fluid from flowing through the



second passage from the high pressure fluid source to the second motor; and

E. valve means responsive to the operation of either the first or second seal means

1. to allow fluid to flow between the low pressure fluid source and the second passage when the first seal means is moved to the one position and to simultaneously prevent fluid from flowing from the first passage to the low pressure fluid source, and

2. to allow fluid to flow between the low pressure fluid source and the first passage when the second seal means is moved to the one position and to simultaneously prevent fluid from flowing from the second passage to the low pressure fluid source.

3,972,190

VEHICLE BRAKE PEDAL ARRANGEMENTS

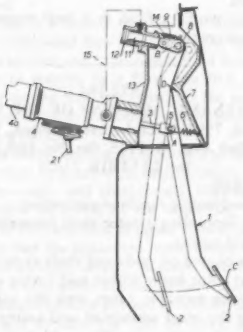
Patrick Frank Sawyer, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed Nov. 18, 1974, Ser. No. 525,009

Claims priority, application United Kingdom, Dec. 3, 1973, 55875/73; Mar. 8, 1974, 10589/74

Int. Cl.² B60F *15/16*

U.S. Cl. 60—551 **7 Claims**



1. A brake pedal assembly for actuating a master cylinder having a power assisting means, comprising a brake pedal pivotable about a first movable pivot point, an actuating member having a pivotal connection with said brake pedal at a point intermediate the ends of said pedal, said actuating member being movable with said pedal to actuate said master cylinder, means holding said first pivot point in a fixed position during normal operation of said power assisting means so that said pedal normally pivots about said first pivot point, means applying the force of said power assisting means to said brake pedal, and a fixed fulcrum intermediate said first-mentioned pivot point and said connection between said pedal and said actuating member and being engageable by said pedal to define a second pivot point about which said pedal fulcrums upon failure of said power assisting means.

3,972,191

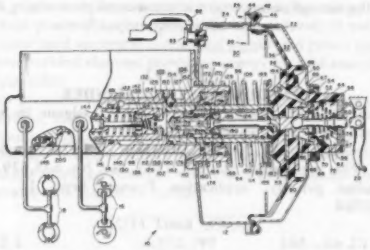
BALANCED SERVOMOTOR VALVE

Frederick G. Grabb, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Aug. 11, 1975, Ser. No. 603,430

Int. Cl.² F15B *7/00*

U.S. Cl. 60—553 **8 Claims**



1. In a power brake apparatus having a servomotor with a control means for transferring an output force of a wall means from a first piston means to a concentric second piston means to produce an additional operational force to activate the wheel brakes in a vehicle in response to a corresponding operator input force, said control means comprising:

a housing having a first bore and a second bore therein, said first piston means being located in said first bore to establish a first pressurizing chamber and a relief chamber, said second piston means being located in said second bore to establish a second pressurizing chamber, said second piston means having a first axial bore and a second axial bore separated by a fixed wall, said second piston means having a first radial bore and a second radial bore located on opposite sides of said fixed wall to permit communication between the first pressurizing chamber and the first and second axial bores, said second piston having a third radial bore for communicating said second axial bore to said relief chamber;

first valve means located in said first axial bore of said second piston means for permitting fluid under pressure to only flow from the first pressurizing chamber into the second pressurizing chamber;

second valve means located in said second axial bore of said second piston means, said second valve means having a cylindrical body with a first face and a second face positioned on opposite sides of said second radial bore to form a control chamber within the second axial bore, said cylindrical body having a passageway through which fluid in the relief chamber is communicated to the first face;

stop means located in said second axial bore of the second piston means between the second radial bore and the third radial bore;

first resilient means located in said second axial bore for urging said second face against said stop means to prevent

communication between the control chamber and the relief chamber; and

actuator means initially responding to an operator for developing said output force across the wall means of the servomotor which will move the first piston in the first pressurizing chamber and the second piston in the second pressurizing chamber to produce a first pressurizing fluid force, said first pressurized fluid force produced in the first pressurizing chamber being simultaneously transmitted into the first axial bore and the second axial bore of the second piston means for communication to the second pressurizing chamber and to said control chamber, said first pressurized fluid force in the control chamber and the fluid in the relief chamber acting across the first face and the second face of the second valve means to develop pressure differential forces which cancel each other, said first resilient means alone providing the closure force which prevents communication between the control chamber and the relief chamber, said actuator means further responding to the operator to overcome said first resilient means to allow fluid under pressure to be communicated into the relief chamber and permit said output force of the wall means of the servomotor to move the second piston means in the second pressurizing chamber to develop said additional output force.

3,972,192

TANDEM MASTER CYLINDER

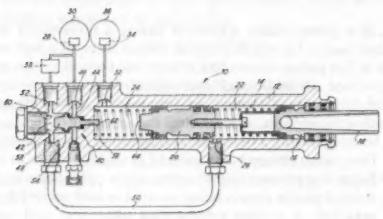
Roland Muterel, Bessan Court, France, assignor to Societe Anonyme D.B.A., Paris, France

Continuation of Ser. No. 503,021, Sept. 3, 1974, abandoned. This application Nov. 26, 1975, Ser. No. 635,529

Claims priority, application France, Sept. 11, 1973, 73.32564

Int. Cl.² B60T *11/20*

U.S. Cl. 60—562 **2 Claims**



1. A tandem master cylinder for a split braking circuit, comprising a housing containing a principal bore, said bore receiving a controlling piston and a floating piston to define therein a first chamber and a second chamber between the floating piston and the end of the bore, said first chamber communicating with a first outlet adapted to be connected through a correcting valve to a first set of brake actuators, said second chamber communicating with a second outlet adapted to be connected to a second set of brake actuators, a bypass valve in said housing located between said first outlet and a third outlet adapted to be connected directly to said first set of brake actuators, said bypass valve including a valve member biased into its closed position by a spring, said valve member being integral with a tappet passing through the end of the principal bore and projecting into the second pressure chamber, said floating piston and said control piston initially sliding in said principal bore in response to each operator input force to develop a first fluid pressure force in said first chamber and a second fluid pressure in said second chamber, said first fluid pressure acting on said bypass valve to hold said valve member in said closed position, said floating piston and said control piston further moving in said principal bore in response to an operator input force when a predetermined fluid pressure differential develops in said principal bore between said first fluid pressure and said second fluid pressure to permit said floating piston to directly engage said tappet and urge said valve member into an opened position to allow free communication from said first chamber through said third outlet to allow said first fluid pressure to operate the first set of brake actuators without being modified by said correcting valve.

3,972,193

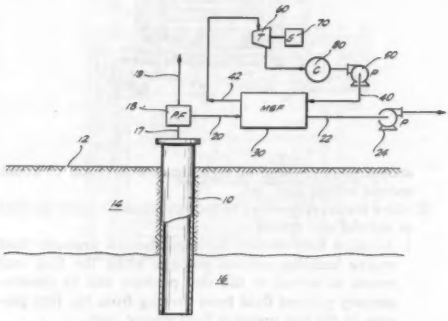
METHOD FOR PRODUCING MECHANICAL ENERGY FROM GEOTHERMAL BRINE

Thomas K. Sherwood, Berkeley, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed July 1, 1975, Ser. No. 592,258

Int. Cl.² F03G *7/00*

U.S. Cl. 60—641 **22 Claims**



1. A method for producing mechanical energy from geothermal brine, which comprises:

producing hot geothermal brine from a subterranean geothermal reservoir;

passing said brine successively through a series of separate flash stages, wherein each successive stage is maintained at a lower pressure less than the vapor pressure of the brine entering that stage so that the brine is partially flashed to vapor in each stage;

countercurrently flowing a working fluid successively through said series of flash stages in indirect heat exchange with the vapor produced in each flash stage, whereby the vapor is condensed in each stage and the working fluid is progressively heated as it passes through said series of flash stages; and

utilizing said working fluid in a heat engine to produce mechanical energy.

3,972,194

THERMODYNAMIC MACHINE OF THE VANE TYPE

Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042

Filed Aug. 13, 1975, Ser. No. 604,347

Int. Cl.² F01K *25/00*

U.S. Cl. 60—650 **4 Claims**

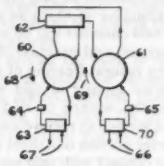
1. A thermodynamic machine comprising:

a. a casing supporting a rotor shaft journalled for rotation within said casing;

b. a rotor mounted on said rotor shaft so as to rotate therewith, said rotor being within said casing off center, said rotor having movable vanes with the vanes outer ends following the inner surface of said casing and providing variable volume spaces within said casing as said rotor rotates;

c. a compressible gaseous working fluid filling said casing and circulating therewithin, with said working fluid being

compressed and expanded while within the variable volume spaces of said casing;



d. a heat transfer fluid being circulated within said casing to exchange heat with said working fluid, said heat transfer fluid being a liquid, with said heat transfer fluid entering said casing and leaving said casing via entry and exit ports provided in said casing.

3,972,195

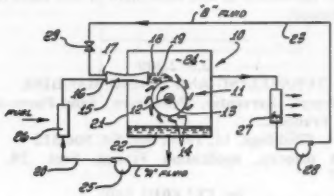
TWO-PHASE ENGINE

Lance G. Hays, La Crescenta, and David G. Elliott, La Canada, both of Calif., assignors to Biphase Engines, Inc., La Crescenta, Calif.

Division of Ser. No. 424,758, Dec. 14, 1973, Pat. No. 3,879,758, which is a continuation-in-part of Ser. No. 310,210, Nov. 29, 1972, abandoned. This application Dec. 23, 1974, Ser. No. 535,372

Int. Cl.² F01K *25/06*

U.S. Cl. 60—671 **11 Claims**



1. In a two-phase power source, the combination comprising

a. a rotor having blades,

b. a nozzle having an outlet directed to discharge a two-phase jet forwardly for impingement on the rotor to rotate same, the nozzle having means to subdivide flow therein, and

c. means to supply a heated first fluid in liquid state to the nozzle for subdivided flow therein toward said outlet and to supply a second and vaporizable fluid in liquid state to the nozzle to receive heat from the first fluid therein causing the second fluid to vaporize in the nozzle and mix with the first fluid in essentially liquid state to produce said discharging jet,

d. each of said blades having, in section, a generally straight surface portion to receive jet impingement, said portion inclined forwardly and transversely relative to the forward direction of travel of the impinging jet to effect separation of the first fluid in liquid state from the second fluid and so that the separated liquid forms a continuous film on said straight surface portion, the blade section also having a concavely curved surface portion merging with said straight surface portion to receive the liquid film therefrom and to turn the film to travel generally reversely relative to said impinging direction, the total rearwardly projected area of said second surface portion being less than one-half the rearwardly projected area of the impinging jet extent.

3,972,196

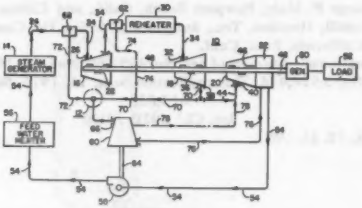
STEAM PRESSURE INCREASING DEVICE FOR DRIVE TURBINES

George J. Silvestri, Jr., Morton, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 10, 1974, Ser. No. 468,710

Int. Cl.² F01K *17/00, 19/00*

U.S. Cl. 60—677 **10 Claims**



1. A steam turbine power plant for producing energy for a load, said power plant comprising:

an associated apparatus connected within said power plant;

a drive turbine element providing energy for said associated apparatus;

a low pressure steam supply source connected to said drive turbine; and,

pressure-increasing means for increasing the pressure of said low pressure supply steam, said pressure-increasing means disposed between said low pressure steam supply source and said drive turbine.

3,972,197

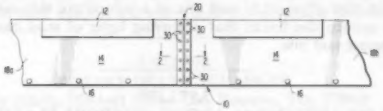
LIGHTWEIGHT END CONNECTORS FOR POLLUTION CONTAINMENT BOOM

John J. Gallagher, 171 Williams Drive, Annapolis, Md. 21401

Filed Apr. 16, 1975, Ser. No. 568,678

Int. Cl.² E02B *3/00*

U.S. Cl. 61—1 F **3 Claims**



1. A fluid-tight connector for elements of floating pollution containment booms comprising disconnectible elements including at least one floating pollution containment boom, at least one of the elements being secured along substantially the entire extent of a verticle edge of said pollution containment boom, complimentary slides on the ends of each of the elements, at least one of said slides including:

a pair of flanges parallelplanar with the plane of and extending from the end of said element to form a groove therebetween; and

transverse members on the free ends of said flanges, said transverse members having rearward faces on each side thereof disposed to form an angle of less than 90° with the plane of said element and to partially close the opening in the groove formed by said flanges,

said flanges being of a thickness substantially equal to the width of said opening,

said transverse members and flanges forming tongues which, when inserted into the groove of a corresponding slide, are configured to form a fluid-tight connection between elements, and said transverse members and flanges including means to direct resultant transverse forces imposed on the flanges forming the groove in-

wardly through reaction on the abutting rearward faces and to block withdrawal of said tongue from said groove in directions other than parallel to said groove.

3,972,198

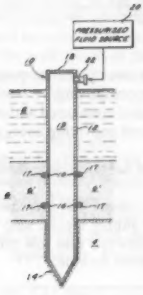
METHOD OF PROTECTING A PILE IMBEDDED IN OFFSHORE AREAS HAVING A SHIFTING LAYER OF MUD

George P. Maly, Newport Beach, Calif., and Clifton A. Tannahill, Houston, Tex., assignors to Union Oil Company of California, Brea, Calif.

Continuation-in-part of Ser. No. 499,650, Aug. 22, 1974, Pat. No. 3,924,414. This application Sept. 12, 1975, Ser. No. 613,038

Int. Cl.² E02D *29/00*

U.S. Cl. 61—98 14 Claims



1. A method for protecting a stationary rigid pile extending through a layer of mud susceptible to movement and imbedded in an underlying competent bottom from the forces that a moving layer of mud can exert against the pile, which comprises ejecting fluid outwardly from the interior of said pile, said fluid being ejected above said competent bottom and into said mud adjacent to said pile at a volumetric rate sufficient to reduce the forces that a moving layer of mud can exert against said pile.

3,972,199

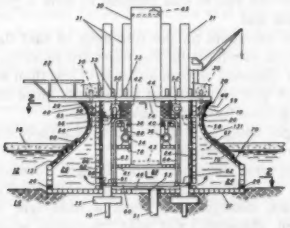
LOW ADHESIONAL ARCTIC OFFSHORE PLATFORM

Thomas A. Hudson, San Francisco, and Gordon E. Strickland, Jr., Yorba Linda, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 266,084, June 26, 1972, Pat. No. 3,831,385. This application July 29, 1974, Ser. No. 490,174

Int. Cl.² E02B *15/02;* F24J *1/00*

U.S. Cl. 61—103 11 Claims



1. A method for reducing ice forces on a marine structure established in a fixed condition in a body of water which becomes frozen through ambient natural conditions, comprising:

forming an enclosed chamber in said marine structure at a position on said structure at which an exterior surface of a wall portion of said chamber will be in contact with said water and in an area on said structure of potential contact with ice caused by natural freezing of said water,

disposing said exterior surface of said wall portion at an angle inclined to the surface of said water to form a sloping, ramp-like surface to receive and elevate above its natural level an edge portion of a sheet of ice as said sheet of ice moves into contact with said surface,

coating said exterior surface with a material having an adhesion between ice and the surface of said material of between zero and 100 psi,

placing a controllable source of heat in communication with the interior of said chamber,

heating the interior of said chamber an amount at least sufficient to cause the temperature of the coated exterior surface to be above the melting point of natural ice formed in said water adjacent said structure,

and controlling the heat of said interior to maintain said temperature of said coated exterior surface above said melting point as said ambient conditions at the location of said structure change,

thereby substantially reducing the adhesion of said ice freezing onto said coated exterior surface under reduced heat conditions, and thus reducing the force exerted on said fixed structure surface by a relative movement of said ice which is in contact with the coated exterior surface and assisting the ice in slipping over and upon said coated surface, and further having a minimum resistance to ice movement as said movement of sheet of ice is continued.

3,972,200

TUNNELLING AND LINING MACHINE

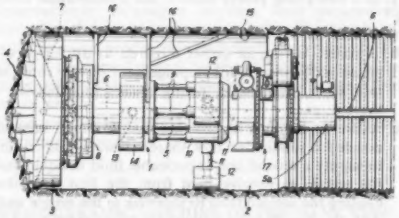
Bruno Scarpi, Kerventec, Penthievre, Saint-Pierre-de-Quiberon, France

Filed Sept. 16, 1974, Ser. No. 506,312

Claims priority, application France, Sept. 20, 1973, 73.33697

Int. Cl.² E01G *5/08*

U.S. Cl. 61—84 8 Claims



1. Tunnelling and lining machine for forming a tunnel with a substantially cylindrical wall,

the machine having a rear end and a front end,

a longitudinal axis extending between the rear end and front end, and a structure extending between the rear end and front end,

a hollow center of the structure accommodating conveyor means for conveying material longitudinally along the structure,

a digging head at the front end of the structure for cutting the working face of the earth to be tunnelled, and means mounting the digging head on the structure,

a rotor mounted concentric with the structure behind the digging head to be rotatable about the longitudinal axis of the structure,

the means mounting the rotor concentric with the structure comprising a slider, means mounting the slider on the structure for longitudinal displacement therealong, with forward and rearward limit positions of such displacement, and drive means for driving the slider in said longitudinal displacement,

drive means for driving the rotor in rotation, and

the rotor comprising means for feeding outwardly towards the wall of the tunnel a flexible band of material to form a helical winding form from the band contiguous to the substantially cylindrical wall of the tunnel.

3,972,201

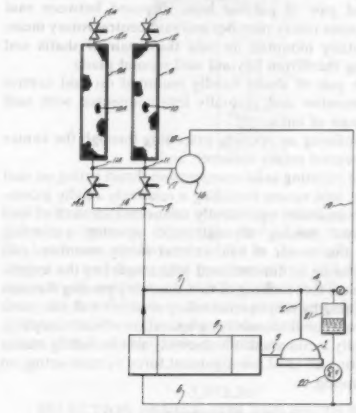
VAPOR RECOVERY SYSTEM

Angelo P. Datis, Los Angeles, Calif., assignor to Process Products, Inc., Gardena, Calif.

Filed Jan. 29, 1975, Ser. No. 545,043

Int. Cl.² F17C 7/02

U.S. Cl. 62—54 **13 Claims**



1. An apparatus for recovering vapors from at least one receiving tank into which a volatile liquid is introduced comprising:

conduit means connected to a tank for conveying vapors from a tank;

refrigeration means having an inlet and an outlet;

pumping means having an inlet connected to said conduit means for conveying vapors from a tank and having an outlet connected to said refrigeration means inlet;

a vapor recirculation conduit from said refrigeration means outlet to said pumping means inlet; and

a liquid drain conduit from said refrigeration means.

3,972,202

CLOSED LOOP CRYOGENIC DELIVERY

Thornton Stearns, Winchester, Mass., assignor to Vacuum Barrier Corporation, Woburn, Mass.

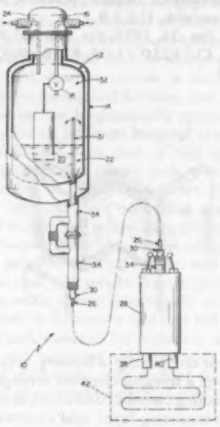
Filed Aug. 23, 1974, Ser. No. 499,833

Int. Cl.² F17C 7/02

U.S. Cl. 62—55 **10 Claims**

1. Apparatus for delivering cryogenic liquid to a heat exchanger wherein said liquid is vaporized for its cooling effect said apparatus having a separator vessel for holding cryogenic liquid in its lower portion and the vapor of said liquid in its upper portion, said vessel being positioned higher than said exchanger and having a vent for discharge of vapor, a feed conduit with an upper and a lower end for conveying cryogenic liquid from said vessel to an exchanger, said feed conduit being connected at its upper end to said vessel to draw cryogenic liquid from the lower portion thereof, and a delivery port for discharging cryogenic liquid to an exchanger, said delivery port being connected to receive cryogenic liquid from the lower end of said feed conduit, comprising

a return conduit with an upper and a lower end for conveying from an exchanger to said separator vessel spent fluid including some vapor, said return conduit connected to discharge at its upper end into the same said vessel from which said liquid is withdrawn by said feed conduit at the pressure of the withdrawn liquid,



a return port for receiving spent fluid from an exchanger, said return port being connected to discharge said spent fluid into the lower end of said return conduit,

said apparatus arranged and connected to provide, when connected to a heat exchanger, an uninterrupted closed loop delivery path from said vessel successively through said feed conduit, said delivery port, said exchanger, said return port, and said return conduit, back to said vessel, in which path circulation of cryogenic liquid is driven by a differential gravity head between cryogenic liquid in said feed conduit and spent fluid in said return conduit.

3,972,203

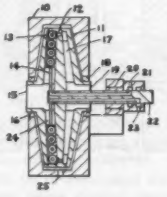
ROTARY HEAT EXCHANGER

Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77063

Continuation-in-part of Ser. No. 216,938, Jan. 11, 1972, abandoned. This application Aug. 31, 1973, Ser. No. 393,571

Int. Cl.² F25B 3/00

U.S. Cl. 62—402 **3 Claims**



1. In a rotary heat exchanger having a rotor having two longitudinally spaced radially extending passages in one of which a first fluid is compressed and heated by the rotation of the rotor and means in heat exchange relationship with the compressed first fluid to remove heat therefrom, the improvement, in combination therewith, of a plurality of nozzles connecting the two radially extending passages through which the first fluid can flow from the passage in which it is compressed to the other passage for expansion, said nozzles being posi-

tioned to discharge said first fluid into said other passage in a direction generally opposite the direction of rotation of said rotor to reduce the tangential velocity of the fluid.

3,972,204

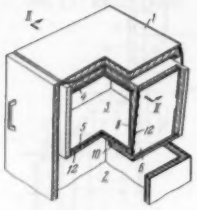
REFRIGERATOR

Mikhail Kirillovich Sidorenko, pereulok Vodometny, 9, kv. 7; Jury Ivanovich Cherkashin, ulitsa Chaikovskogo, 11, kv. 30, and Nikolai Nikolaevich Lopatin, pereulok Rechnoi, 3, kv. 95, all of Krasnoyarsk, U.S.S.R.

Filed Jan. 24, 1975, Ser. No. 543,904

Int. Cl.[2] F25D *11/02;* **F25B** *39/02*

U.S. Cl. 62—447 **5 Claims**



1. A refrigerator comprising: a housing; a cooling chamber inside said housing; a freezing chamber arranged at the upper portion of said cooling chamber and constructed as an evaporator with a heat-insulating layer; said evaporator being constructed as a four-wall shell of a substantially rectangular shape, comprising a top, bottom and two side walls; each of said walls having a slot substantially at the place where it is joined with an adjoining wall; said heat-insulating layer being arranged on the internal surfaces of said side walls of said shell and on the external surfaces of said top and bottom walls of said shell and passing through each of said slots as it extends from one wall to another.

3,972,205

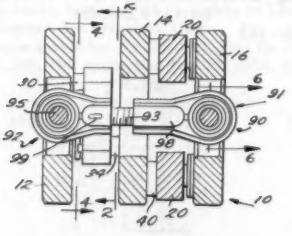
AXIAL THRUST RESISTING IN-LINE COUPLING

Richard Schmidt, 11525 Islandale Drive, Cincinnati, Ohio 45240

Filed Oct. 3, 1974, Ser. No. 511,696

Int. Cl.[2] F16D *3/54*

U.S. Cl. 64—19 **10 Claims**



1. A coupling for drivingly interconnecting a pair of shafts or the like in axial alignment operable to transmit therebetween high rotational speeds and torques while resisting axial compression thrusts, said coupling comprising

a. three rotary members mounted in an arrangement in which a central rotary member is disposed between first and second outer rotary members, each of said rotary members having a shape symmetrical about an axis of symmetry which is aligned with the axis of the shafts to be connected when in said axially aligned relation,

b. a first pair of shafts fixed to said first rotary member and extending outwardly thereof toward said central rotary member, the axes of said first pair of shafts being disposed in equally spaced parallel relation with the symmetrical axis of said first rotary member and being equally spaced from a first plane passing through the symmetrical axis of said first rotary member,

c. a first pair of parallel links disposed between said first rotary member and said central rotary member pivotally mounted on said first pair of shafts and extending therefrom beyond said first plane,

d. a second pair of shafts fixedly mounted on said central rotary member and pivotally interconnected with said first pair of links,

e. a third pair of shafts fixed to said second rotary member and extending outwardly therefrom toward said central rotary member, the axes of said third pair of shafts being equally spaced from a second plane passing through the symmetrical axis of said second rotary member in generally perpendicular relation to said first plane,

f. a second pair of parallel links disposed between said second outer rotary member and said central rotary member pivotally mounted on said third pair of shafts and extending therefrom beyond said second plane

g. a fourth pair of shafts fixedly mounted on said central rotary member and pivotally interconnected with said second pair of links,

h. means defining an opening extending through the center of said central rotary member, and

i. means for resisting axial compression thrust acting on said coupling, said means including a relatively axially incompressible assembly operatively connected to each of said shafts and passing through said opening extending through the center of said central rotary member, said opening being so dimensioned with respect to the lengths of said links that striking of said assembly passing through said opening by said central rotary member will not occur during rotational transmitting operation of said coupling, said axially incompressible assembly also including means for resisting all axial misalignment force vectors acting on said coupling.

3,972,206

PATTERN SELECTOR

Vladimir Mureso, Brno, Czechoslovakia, assignor to VVU Zavodu vseobecneho strojirenstvi, Brno, Czechoslovakia

Continuation-in-part of Ser. No. 309,948, Nov. 27, 1972, abandoned. This application May 6, 1974, Ser. No. 467,120

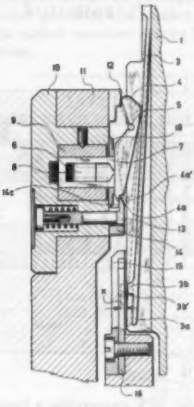
Claims priority, application Czechoslovakia, June 25, 1970, 4435

Int. Cl.[2] D04B *9/00*

U.S. Cl. 66—50 R **4 Claims**

1. Knitting device with individual selection of needle units for pattern producing on a knitting machine, comprising at least one needle bed with a number of slots for the needle units, each needle unit having at least one part spring-loaded, forcing said part out of said slot, said needle units individually provided with selection sinkers, said selection sinkers being disposed at one level of the machine, each said selection sinker suspended pivotably on a part mounted on the needle bed and stationary relative thereto, said selection sinker being adapted for compressing the spring-loaded part of the needle unit into its slot in the needle bed, each needle unit adapted for selection at two selection places spaced apart a predetermined number of needle distances and adapted for relative movement with respect to the needle bed, a single selection magnet having a permanent magnet and pole shoes disposed at each selection place, each selection magnet provided with means for temporary substantial reduction of the power of its magnetic field by electric signals, means for causing the selection sinker prior to selection to be brought within the influence of the magnetic field of the selection magnet causing a simultaneous compression of the needle unit into the respec-

tive needle slot, the permanent magnet of each selection magnet retaining selected sinkers, the temporary reduction means being actuated by electric signals for overcoming the attraction between selected sinkers and the permanent magnets whereby to release only said selected sinkers, lifter means comprising one curved knit part and one curved tuck part, each of said curved parts corresponding to a respective one of

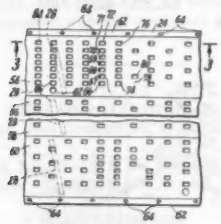


said selection places, the respective curved pasts being individually adapted to engage the butt of the needle unit when the latter extends beyond its slot in the needle bed to lift it from a normal disengaged position to knit and tuck positions, respectively, said curved parts being located the same distance from the needle bed so that the extension of the butt of a selected needle unit from the needle slot into engagement with either of said curved parts is identical.

3,972,207
SELECTION DEVICE FOR THE NEEDLES OF A KNITTING MACHINE

Juan Vinas, Brooklyn, N.Y., assignor to Vinatex Knitting Systems, Inc., Brooklyn, N.Y.

Filed Nov. 4, 1974, Ser. No. 520,417
Int. Cl.² D04B 9/00
U.S. Cl. 66—50 R **6 Claims**

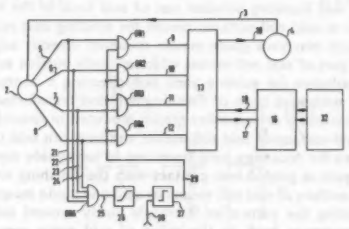


1. A selection device for knitting machines having a rotating cylinder with slots around its circumference for accommodating a knitting needle and an associated needle jack in each slot, said device comprising selection tape means for controlling a number of jack selectors of at least one feed station, said jack selectors being disposed adjacent to the cylinder, a portion of each of said jack selectors being movable between a first position away from the cylinder for preventing engagement with the needle jacks to define an operative jack position and a second position close to the cylinder for engagement with associated needle jacks to move each of said associated jacks into its r'ot to define a non-operative jack position, said selection tape means including a tape loop and stationary detecting means coacting with said tape loop for determining said first and second positions of said portion of each of said jack selectors to provide a predetermined knitting pattern, drive means for moving said tape loop in synchronization with the cylinder and relative to said stationary detecting means, cam means for moving each of said needle jacks in said operative jack position along its slot into engagement with its associated knitting needle to move said associated knitting needle into an active position for knitting said knitting pattern, where the needles associated with each of said needle jacks in said non-operative jack position remain in their respective slots and are non-active during said knitting, said tape loop including at least one section longitudinally around said tape loop, said section including adjacent portions extending longitudinally around said tape loop, each of said tape loop portions being associated with one of said jack selectors at said feed station, a plurality of detectable means being disposed in longitudinally adjacent rows extending transversely across width of a said section and intersecting said tape loop portions to provide individual detectable means associated with a particular needle jack and knitting needle, said detecting means controlling said jack selectors by consecutively detecting said individual detectable means transversely across each of said rows, row-by-row, to determine said first and second positions of each of said jack selectors for providing said operative and non-operative jack positions, said stationary detecting means being disposed diagonally with respect to the transversely extending rows of detectable means for controlling said jack selectors.

3,972,208
PATTERNING CONTROL ARRANGEMENTS FOR KNITTING MACHINES

Leslie Joseph Ferrington, Leicester, England, assignor to Wildt Mellor Bromley Limited, Leicester, England

Filed Dec. 17, 1974, Ser. No. 533,475
Claims priority, application United Kingdom, Dec. 20, 1973, 59261/73
Int. Cl.² D04B 9/00
U.S. Cl. 66—50 R **9 Claims**



1. In a patterning control arrangement for multi-feed knitting machines of the type comprising a needle cylinder having needles accommodated in tricks therein, individually selectable patterning butts on or associated with each needle, the said patterning butts being divided into groups at spaced heightwise locations in relation to the needle tricks, and a number, equal to the number of groups, of pattern control means at each feed station with each pattern control means at a station being cooperable with the patterning butts of one group to engage or miss those butts whereby to control the operation of the associated needle wherein the pattern control means each includes an electromagnetically-operated actuator controlled by circuitry arranged to provide operating pulses for the actuator in response to triggering pulses,

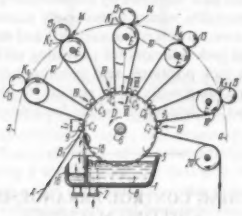
wherein the improvement comprises that the circuitry is responsive to a specified one of the positive-going or negative-going edges of the triggering pulses to initiate the operating pulses, and inverter means for effectively inverting the triggering pulses at a predetermined speed of operation of the machine whereby the operating pulses are produced in response to the completion of the triggering pulses at operating speeds below the predetermined speed, and in response to the initiation of the triggering pulses at higher operating speeds.

3,972,209

APPARATUS FOR WASHING YARN DURING MOVEMENT THEREOF

Arkady Trofimovich Serkov, prospekt Mira, 131, kv. 20, Moscow; Boris Matveevich Sokolovsky, ulitsa Pervomaiskaya, 27, kv. 71, Mytischi Moskovskoi oblasti; Viktor Alexandrovich Kalitin, ulitsa Dispansera, 38, korpus 1, kv. 75, Mytischi Moskovskoi oblasti, and Nina Petrovna Shishkina, ulitsa Scherbakova, 4, kv. 41, Mytischi Moskovskoi oblasti, all of U.S.S.R.

Filed Nov. 18, 1974, Ser. No. 524,743
Int. Cl.² D06B *1/14*
U.S. Cl. 68—22 R **4 Claims**



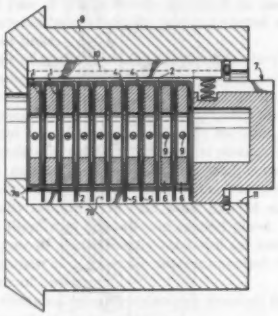
1. An apparatus for washing freshly spun artificial yarn during its movement comprising: a tank for a finishing solution; a rotating solution-transfer roll means mounted over said tank and being partially immersed in said finishing solution contained in said tank so that a portion of the surface of said roll means extends outside the finishing solution for transferring said finishing solution out of said tank in the form of a layer at said roll surface; means for rotating said roll means; at least two yarn guide means mounted directly adjacent to that part of said roll means which extends outside said finishing solution for guiding yarn and effecting a contact of the yarn with said layer of finishing solution transferred by said roll means; a driven roller means mounted in spaced relation to said surface of said roll means and between said two guide means for receiving yarn from one of said guide means after the yarn is guided into contact with the finishing solution at said surface of said roll means by said one guide means and for directing the yarn after it travels partly around said driven roller means back to the other of said guide means to be guided by the latter again into contact with the finishing solution at said surface of said roll means while spacing the yarn apart from said surface of said roll means; means for rotating said driven roller means in a direction opposite to the rotational direction of said solution-transfer roll means; an additional roller means in permanent engagement with said driven roller means to form a squeezing pair of roller means defining a nip therebetween, the yarn being fed by said pair of roller means through said nip therebetween to travel in the direction opposite to the rotational direction of said solution-transfer roll means; an additional tank mounted below said solution-transfer roll means; a scraper means disposed in said additional tank in permanent contact with the surface of said rotating solution-transfer roll means below the zone of guiding of the yarn thereto by said one of said guide means, said scraper means removing said layer of finishing solution from said roll surface and directing the removed finishing solution into said additional tank.

3,972,210

CYLINDER LOCK

Pentti Toivonen, and Esko Tyynelä, both of Joensuu, Finland, assignors to Oy Wartsila AB, Helsinki, Finland

Filed Sept. 25, 1975, Ser. No. 616,891
Int. Cl.² E05B *15/14*
U.S. Cl. 70—366 **4 Claims**



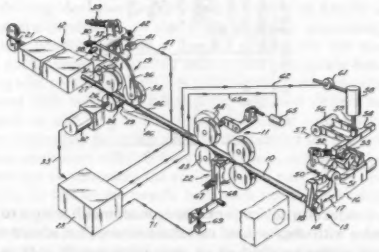
1. A disc cylinder lock comprising a turnable cylinder enclosing a plurality of locking discs, turnable by the key of the lock and between adjacent locking discs, intermediate discs, said intermediate discs being radially larger than said locking discs, and being provided on one side with an axially extending edge portion defining a cup-formed space on one side of said intermediate disc, the opposite side of the disc being its bottom side, said axially extending edge portion contacting the bottom side of an adjacent intermediate disc, said last mentioned bottom side forming a cover on said cup-formed space, thereby providing a substantially closed space for each locking disc, located between two adjacent intermediate discs.

3,972,211

BAR END DROPPER FOR FORGING MACHINES OR THE LIKE

James D. Linthicum, and Robert E. Wisebaker, both of Tiffin, Ohio, assignors to National Machinery, Tiffin, Ohio

Continuation-in-part of Ser. No. 521,972, Nov. 8, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,285
Int. Cl.² B26D *7/02*
U.S. Cl. 72—14 **23 Claims**



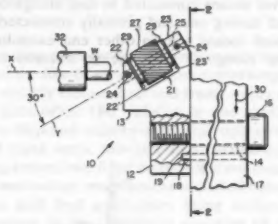
1. A machine for performing operations on elongated lengths of stock comprising operator means at an operating location normally operable to perform repeated operations on said stock as said stock moves to said operating location, feed means to feed stock to said operating location, and sensing means at a control point operable to determine the movement

of one end of a length of stock past said control point and to modify the operation of said operator means as said one end approaches and passes said operating location, said sensing means providing support operable to normally maintain said stock in one position and to allow lateral movement thereof to another position when an end portion passes said control point, and a sensor member engaging said stock and being maintained in a first position when said stock is in said one position and moving to a second position when said stock moves to said another position, said sensing means generating a signal when said sensor member moves between said first and second positions.

3,972,212
PROGRESSIVE KNURL HOLDER

Robert J. Brinkman, 389 Washington St., Spencerport, N.Y. 14559

Filed June 16, 1975, Ser. No. 587,102
Int. Cl.² B21H 7/14
U.S. Cl. 72—102 **8 Claims**



1. In a machine of the type having a work spindle and a cross slide reciprocable transverse to the axis of said spindle, a knurling device comprising

a holder,

means for releasably mounting said holder on said machine for movement by said cross slide transverse to the axis of said spindle,

an annular knurling wheel having a plurality of spaced knurling teeth in its outer periphery for knurling a workpiece chucked in said spindle, and

means supporting said wheel on said holder for rotation about an axis inclined to and spaced from the work spindle axis,

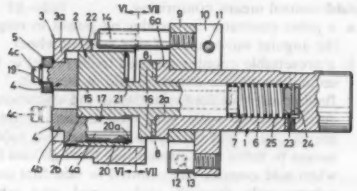
said holder being operative, during movement by said slide, to move said wheel transversely past a rotating workpiece in said spindle, while supporting the wheel for tangential, rolling engagement with said workpiece to knurl its outer surface.

3,972,213
THREAD-ROLLING HEAD

Harold Habegger, Sous Graitery 10, 2738 Court, Bern, Switzerland

Filed July 31, 1975, Ser. No. 600,811
Claims priority, application Switzerland, Aug. 6, 1974, 10745/74
Int. Cl.² B21H 3/04
U.S. Cl. 72—104 **7 Claims**

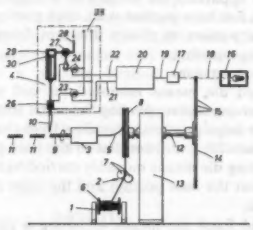
1. A thread-rolling head for processing a workpiece and comprising a support member, a bearing member held in front of said support member and having an axis in common therewith, three crank-like support pieces identical to one another and each having a pivot pin, a supporting journal, and a cheek, three bearing bores made in said bearing member and distributed about said common axis, each said pivot pin being situated in a respective said bearing bore, three thread rollers, each said thread roller being borne by a respective said supporting journal, a control member coaxially surrounding said bearing member and having an inner flange, the inner side of said flange forming a control surface, each said cheek resting against a respective section of said control surface, stop means disposed on said support member and on said bearing member, and a spring disposed within said support member, said control surface being so designed that a relative rotation between said bearing member and said control member causes a uniform pivoting of said support pieces away from one another and, said stop means being adapted either to engage with one another and thereby to prevent said relative rotation or to disengage from one another and thereby to enable said spring to bring about said relative rotation, wherein said control member is held unrotatingly on said support member whereas said bearing member is held rotatingly, said stop means being operative between said bearing member and said support member in such a way that during operation, said stop means transmit to said support member a torque transmitted from said workpiece to said bearing member via said thread rollers, a forward displacement of said bearing member relative to said support member caused by said workpiece rendering said stop means inoperative, and said torque, temporarily still acting upon said bearing member, aiding said spring in rotating said bearing member for enabling said pivoting of said support pieces away from one another.



3,972,214
MACHINE FOR MANUFACTURING WIRE COILS

Adolf Jagersberger, Salzburg, Austria, assignor to Bleckmann & Co., Salzburg, Austria

Filed June 2, 1975, Ser. No. 583,058
Int. Cl.² B21F 11/00
U.S. Cl. 72—132 **6 Claims**



1. A machine for manufacturing wire coils, which comprises
1. feeding means for delivering wire,
2. winding means for receiving said wire from said feeding means and for forming said wire into a continuous helix,
3. a sensing wheel arranged to contact the wire between said feeding means and said winding means and to perform an angular movement corresponding to the advance of said wire in contact with said sensing wheel,
4. cutting means operable to cut wire coils from said helix, said cutting means comprising

a. a cutting tool and tool-driving means operable to move said cutting tool in a first step from an initial position

in which said cutting tool is spaced from said helix to an intermediate position in which said cutting tool is disposed between two adjacent convolutions of said helix, and in a second step from said intermediate position to a final position so as to cut through the helix, the tool-driving means including a first solenoid energizable to move said cutting tool through said first step and a pneumatic actuator operable to move said cutting tool through said second step, and

5. control means for controlling the operation of said cutting means in response to the angular movement of said sensing wheel so as to cause said cutting means to cut wire coils having a predetermined length from said helix, said control means comprising
   a. a pulse generator for producing pulses in response to the angular movement of said sensing wheel,
   b. a presettable counter adapted to be preset to first and second counts for counting said pulses, and
   c. final control means for initiating the operation of said cutting means when said counter has counted to a preset count and arranged to cause said tool-driving means to move said cutting tool through said first step when said counter has counted to said first count and subsequently through said second step when said counter has subsequently counted to said second count, said final control means including a first thyristor arranged to be fired immediately when said counter has counted to said first count, a second thyristor arranged to be fired immediately when said counter has counted to said second count, said first solenoid being arranged to be energized in immediate response to the firing of said first thyristor, a second solenoid arranged to be energized in immediate response to the firing of said second thyristor, and a valve arranged to admit compressed air to said pneumatic actuator to operate the same in immediate response to the energization of said second solenoid.

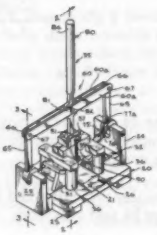
3,972,215

APPARATUS FOR CUTTING A CURVED EDGE ON A METAL STRIP HAVING SURFACES IN MORE THAN ONE PLANE

Gene C. Elkins, 2940 Patio Drive, Houston, Tex. 77017

Filed Feb. 28, 1975, Ser. No. 554,163
Int. Cl.² B21D *31/02*
U.S. Cl. 72—326 **1 Claim**

1. An apparatus for cutting in a single pass a metal strip having a flat base portion with edge portions extending from the base portion in planes different from that of the base portion comprising:
   a. support means;
   b. fixed die means mounted on said support means for receiving and supporting the metal strip having a flat base with edge portions extending from the base portion in a plane different from that of the base portion;
   c. cutting die means movably carried by said support means to cut the base portion and the edge portions in a single pass;
   d. said fixed die means including a pair of fixed dies in aligned, spaced, horizontal relationship to provide a space for receiving said cutting die means therebetween when actuated;
   e. actuating means carried by said support means and connected to said cutting die means for effecting movement thereof to cut the edge portions and the base portion of the metal strip;
   f. said support means including:
      1. a base member for receiving and supporting said pair of fixed dies in said aligned, spaced, horizontal relationship;
      2. a pair of members mounted on said base member in opposed relation to each other on each side of said fixed die means, with each of said members having an opening inclined toward and aligned with the space between said pair of fixed dies; and
      3. additional means mounted on said base member and having an opening vertically aligned with the space between said pair of fixed dies;
   g. said cutting die means being slidably positioned in the openings in said pair of members to form the edge portion cutting dies and said cutting die means being slidably positioned in the opening in said additional means to form the base portion cutting die;
   h. said actuating means carried by said support means and connected to said cutting die means including:
      1. elongated shaft means;
      2. shaft members pivotally secured at one end to said elongated shaft means and at their other end to said support means whereby said elongated shaft means and shaft members may be rocked laterally relative to said support means;
      3. eccentric means pivotally connected to said other end of said shaft members and to said edge portion cutting dies slidably positioned in said pair of members;
      4. lever means connected to said elongated shaft means and having one end pivotally connected to said additional means and an other end extending away from said elongated shaft means whereby said elongated

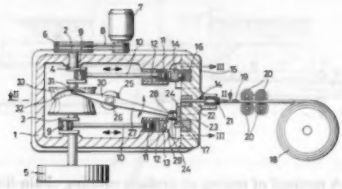


shaft means and pivotally connected shaft members may be rocked by said lever means;
      5. said one end of said lever means having a surface eccentric to said pivotal connection between said lever means and additional means, said eccentric surface being engagable with the base portion cutting die;
      6. said lever means movable in one direction laterally of said support means to move said shaft members, eccentric means and edge portion cutting dies connected therewith into the space between said aligned, horizontal pair of dies to cut the edge portions of the metal strip and said lever means movable in the other direction laterally of said support means to engage said eccentric surface with and move said base portion die supported in said additional means into the space between said aligned, horizontal pair of dies to cut the base portion of the metal strip;
   i. said base portion cutting die being supported in said additional means by spring means which normally tend to retract said base portion cutting die away from said fixed die means;
   j. said base portion cutting die being shaped to cut the metal strip base portion to form a convex edge thereon; and
   k. said edge portion cutting dies being shaped to cut the metal strip edge portions at a receding angle relative to the convex edge on the base portion of the metal strip.

3,972,216
RECIPROCATING PRESS

Klaus Messerschmidt, Schonungen, Germany, assignor to Firma Sebastian Messerschmidt, Spezialmaschinenfabrik, Schonungen, Germany

Filed Jan. 29, 1975, Ser. No. 545,062
Claims priority, application Germany, Feb. 6, 1974, 2405530
Int. Cl.² B21D *28/00*
U.S. Cl. 72—337 5 Claims

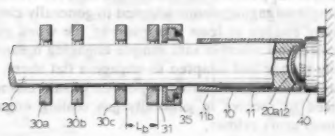


1. A reciprocating press for forming articles such as sphere-like objects and the like from workpieces comprising a frame, a crankshaft rotatably mounted on said frame, said crankshaft having crank arms offset 180° relative to one another, connecting means disposed side-by-side and operatively connected to said crank arms, movable dies carried by each of said connecting means, two fixed mating dies mounted on said frame, a feed mechanism reciprocable mounted between said two fixed dies, said feed mechanism being reciprocal in a direction transverse to the reciprocal direction of said connecting means which carry said movable dies, means for feeding an elongated rod to a position disposed between said two fixed dies, said feed mechanism having two cutting edge means such that upon reciprocation of said feed mechanism in one direction, one cutting edge means shears off a workpiece from said elongated rod and feeds said sheared off workpiece to one fixed die and, upon reciprocation of said feed mechanism in the opposite direction, the other cutting edge means shears off another workpiece from said elongated rod and feeds said sheared off workpiece to the other fixed die, whereby said feed mechanism is operable to cut off said workpieces and feed the cut-off workpieces alternately to each of said two fixed dies as the movable dies move in opposite directions.

3,972,217
DEEP DRAWING OF CUP-SHAPED ARTICLE FOR EASY REMOVAL FROM PUNCH

Kazunaga Misonoo, Kudamatsu, Japan, assignor to Yoshizaki Kozo, Tokyo, Japan

Filed Feb. 3, 1975, Ser. No. 546,782
Claims priority, application Japan, Mar. 22, 1974, 49/31537
Int. Cl.² B21D *45/00*
U.S. Cl. 72—344 4 Claims

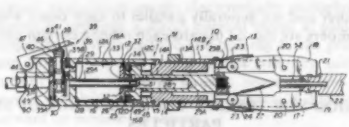


1. A method of deep drawing a cup-shaped article in which a blank is placed on a punch and the punch is passed through a series of deep drawing dies, the method being for carrying out the drawing so that the force required to strip the drawn cup-shaped article from the punch is substantially less than in a conventional method, said method comprising, after the deep drawing is completed, slightly drawing the cup-shaped article to the final desired dimensions by a drawing step in which the wall thickness of the article is reduced no more than 10%.

3,972,218
FLUID ACTUATED TOOL

James A. Pawloski, P.O. Box 155, Pomfret Center, Conn. 06259

Filed Dec. 23, 1974, Ser. No. 535,351
Int. Cl.² B21D *7/06*
U.S. Cl. 72—407 6 Claims



1. A fluid actuated, work performing tool comprising:
a housing having a power end portion and a work engaging end portion,
said power end portion defining a chamber,
and said power end portion including a fluid inlet and an exhaust port adapted to be in communication with said chamber,
a common valve means for sequencing the opening and closing of said inlet and exhaust port,
a piston moveably disposed within said chamber for movement between an operative and inoperative position,
a work engaging means is connected on said work engaging end portion,
a ram connected to said piston for movement between a retracted and protracted position for activating said work engaging means between an operative and inoperative position,
and a bleed tube extending internally of said chamber,
said bleed tube defining a passage,
said piston being slideably mounted on said bleed tube
and a port opening to said tube for connecting said passage with the pressure side of said chamber only in a fully protracted position of said piston only,
and said passage being in communication with said valve means whereby a portion of said fluid in said chamber is by-passed to said valve means only when said piston has protracted to a position beyond said port opening whereby,
said by-passed fluid activates said valve means to valve said exhaust port to an open position to exhaust said chamber whereby said piston and connected ram is returned to the retracted position.

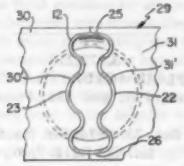
3,972,219
APPARATUS FOR MAKING THE INLET END OF A TUBULAR BURNER CONSTRUCTION

Fred Riehl, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 412,103, Nov. 2, 1973, Pat. No. 3,874,839.
This application Jan. 15, 1975, Ser. No. 541,154
Int. Cl.² B21D *7/00*
U.S. Cl. 72—416 2 Claims

1. An apparatus for making the inlet end of a tubular burner construction comprising a pair of cooperating die members each having a die surface means for engaging the cylindrical end of said tubular burner construction and forming said cylindrical end into a pair of spaced gripping means respectively interconnected together at opposed ends thereof by substantially C-shaped resilient parts, said surface means

forming said gripping means and said C-shaped parts to have arcuate portions disposed in two planes that are spaced from



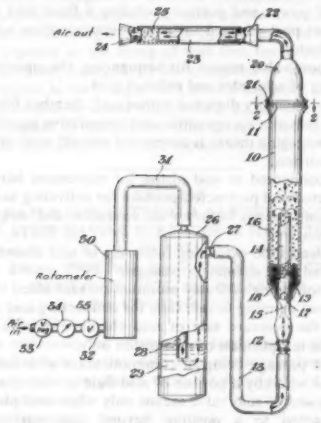
each other and are generally parallel to each other when said die members are moved toward each other a certain amount.

3,972,220

METHOD FOR TESTING THE RESILIENCE OF SOLID PARTICLES

Charles H. Moore, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 7, 1975, Ser. No. 575,271
Int. Cl.² G01N *3/56*; B02C *19/06*
U.S. Cl. 73—7 **3 Claims**



1. A method for testing the resilience of solid particles which are to be coated in a fluidized bed operation, the method comprising:

placing a bed of solid particles in a hollow, vertical chamber, which has a top end and a bottom end;

directing a stream of gas into the bottom end of the chamber and an eductor tube positioned in the chamber at controlled metered flow rate which will cause the particles to fluidize within the chamber and to continuously recycle through the chamber;

maintaining the particles in the fluidized recycling condition for a period of time which will cause a portion of the particles to abrade to a dust phase;

propelling only the particles in the dust phase through a screen member positioned at the top end of the chamber;

depositing the particles which pass through the screen member in a collector tube which has been previously weighed and which communicates with the screen; and

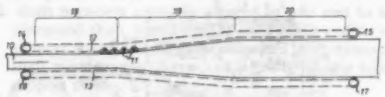
weighing the dust phase particles which are deposited in the collector tube after the particles are abraided and propelled through the screen member.

3,972,221

METHOD AND DEVICE FOR TESTING A CHAIN LINK MECHANISM

Luc Yves Natens, Berchem, and Jean Martha De Gueldre, Edegem, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed June 10, 1975, Ser. No. 585,758
Claims priority, application United Kingdom, June 11, 1974, 25843/74
Int. Cl.² G01N *19/02*
U.S. Cl. 73—9 **15 Claims**



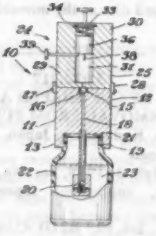
1. A method of testing an endless rotating chain-link mechanism which has an endless series of rollers moving in an endless path defined by a stationary guide, in order to detect whether a defective roller is present, wherein during the rotation of the chain-link mechanism each of said rollers is engaged at a certain region along said endless path by a driven rotating member which brings such roller while out of contact with said guide to a predetermined speed of rotation; and the energy consumed in causing said rotary member to keep the roller rotating at that speed for a predetermined time is used as a measure of the resistance to rotation of that roller.

3,972,222

METHOD AND APPARATUS FOR TESTING ARTICLES EMPLOYING A SMALL ARMS PRIMER

Edward H. Yonkers, and Floyd B. Nagle, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 1, 1972, Ser. No. 285,575
Int. Cl.² G01N *3/30*
U.S. Cl. 73—12 **1 Claim**



1. A testing apparatus, the testing apparatus comprising

a sample support means, the sample support means having

a sample engaging means adapted to generally circumferentially engage at least a portion of the work piece to be tested and wherein said sample engaging means is generally planar and adapted to engage a flat sheet,

means defining a chamber, a portion of said chamber being sized to receive in generally gas sealing engagement a small arms primer,

a gas passage, the gas passage communicating with the region encompassed by the peripheral engaging means, and

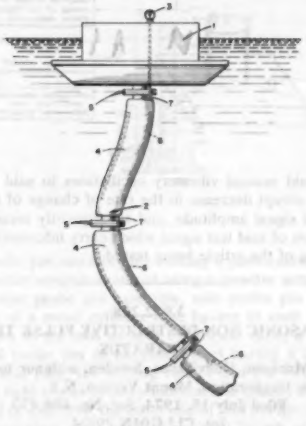
a primer activating means in operative combination with said chamber and adapted to activate a primer placed therein.

3,972,223

FLOATING PLANT FOR CHARGING AND DISCHARGING MINERAL OIL PRODUCTS AND THE LIKE

Flavio Torghele, Milan, Italy, assignor to Treg S.p.A., Veniceano, Italy

Filed June 13, 1974, Ser. No. 479,100
Claims priority, application Italy, June 13, 1973, 25296/73
Int. Cl.² G01M 3/28
U.S. Cl. 73—12 8 Claims



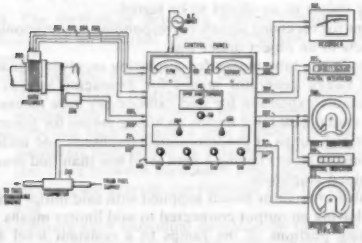
1. A floating plant for charging and discharging mineral oil having a floating platform, a visible pressure gauge and a flexible hose for connecting the platform to a pipe fixed on the bottom of a body of water, said flexible hose comprising a tube for conveying oil and a protective jacket about the tube, said jacket comprising internal rigid members spaced from each other to provide circumferentially spaced open spaces which extend longitudinally through the hose and are of substantially constant volume, said spaces being filled with a liquid under pressure, and means for connecting the open spaces to the pressure gauge whereby impacts on the jacket cause a variation in the pressure of the said liquid which is indicated on the pressure gauge.

3,972,224

SHAFT EFFICIENCY MONITORING SYSTEM

Maxwell Ingram, 15 Hamilton Ave., Dumont, N.J. 07628

Division of Ser. No. 469,900, May 14, 1974. This application Jan. 3, 1975, Ser. No. 538,441
Int. Cl.² G01L 3/26
U.S. Cl. 73—114 19 Claims



1. A system for determining the power being transmitted through a rotated shaft from a fuel consuming engine, comprising:

first means mounted on said shaft for generating a direct current signal having a magnitude proportional to torque transmitted through said shaft and a polarity corresponding to torque direction, said first means including a husk assembly clamped about said shaft and a linear variable differential transformer carried on said husk assembly;

second means coupled with said husk assembly for generating a direct current signal having a magnitude proportional to shaft rotational speed and a polarity corresponding to rotation direction;

electronic circuit means having first and second inputs connected to receive said generated direct current signals from said first and second means, respectively, and an output; said circuit means electronically multiplying said signals to produce a direct current signal at said output proportional in mangitude and polarity to the product of said first and second input signals whereby said direct current output signal is linearly representative of the horsepower being transmitted through said shaft in either forward or reverse directions;

flowmeter means for determining the rate of fuel being consumed by the engine in the transmission of power through said shaft and providing a direct current output signal representative thereof; and

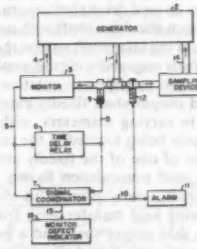
divider means connected to said circuit means and said flowmeter means for electronically dividing the output signal of said flowmeter means by the output signal of said circuit means whereby a direct current signal representative of instantaneous efficiency is provided.

3,972,225

SAMPLING SYSTEM FOR POWER GENERATORS

Emil M. Fort, Murrysville; Thomas D. Kaczmsrek, and David C. Phillips, both of Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 19, 1973, Ser. No. 426,391
Int. Cl.² G01N 1/22, 33/32
U.S. Cl. 73—28 13 Claims



1. A sampling system comprising:

A. gas stream-monitoring means for detecting the thermal degradation of materials by monitoring a gas stream exposed to the products of said thermal degradation, and for generating a first signal when said thermal degradation is detected;

B. analysis means for automatically determining whether said gas stream monitoring means is functioning properly when said first signal is generated and if so, for automatically generating a second signal; and

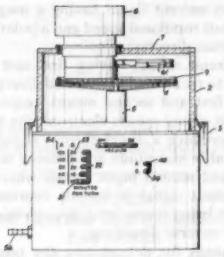
C. sampling means for automatically sampling said gas stream when said second signal is generated.

9. A sampling system according to claim 1 wherein said gas stream is a cooling gas stream in an electrical generator.

3,972,226
SLIT IMPACT AIR SAMPLER

Calvin Briggs Rountree, 9028 Gatewood Drive, Jonesboro, Ga. 30236, and Donovan Charles Philpin Mitchell, 1511 Yale Drive, Hollywood Hills, Fla. 33021

Filed Aug. 12, 1975, Ser. No. 604,004
Int. Cl.² G01N *15/00*
U.S. Cl. 73—28 7 Claims



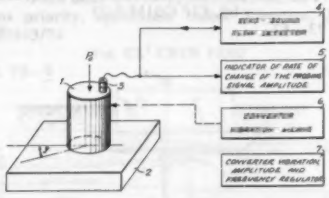
1. An impact air sampler comprising the combination of:
a. An impact chamber with an outlet passage;
b. A rotating platform positioned in said impact chamber and mounted on an output shaft;
c. An inlet slit tube projecting through a wall of said impact chamber with the slit located above said rotating platform, with means for the flow of air into said inlet slit and out of said outlet passage;
d. A variable speed transmission for rotating said platform at variable speeds, said transmission having a drive shaft positioned parallel to the axis of rotation of said output shaft, said drive shaft fixedly carrying two co-axial gears of varying diameters, with means to rotate said drive shaft, said transmission having an idler shaft positioned parallel to the axis of rotation of said output shaft and located on the opposite side of said drive shaft from said output shaft, said idler shaft fixedly carrying a series of co-axial gears, said idler shaft also carrying two co-axial gears which are axially shiftable but rotate with the idler shaft, said gears being of approximately the same diameters as the gears on said drive shaft, means for selectively engaging a gear on the drive shaft with one of the axially shiftable gears on the idler shaft so that the larger gear on one of the shafts is engaged with the smaller gear on the other shaft so as to provide two rotation speeds for the idler shaft, said output shaft fixedly carrying a series of co-axial gears in varying diameters, with the transverse plane of each gear being located in the same place as the transverse plane of one of the fixedly attached gears on the idler shaft, said transmission having a transfer gear carried on a shaft axially parallel to the output shaft, means for moving said transfer gear from engagement with a gear on said output shaft and a gear in the same transverse plane on said idler shaft into a position clear of said gears and back into engagement with another gear on said output shaft and a gear in the same transverse plane on said idler shaft.

3,972,227
METHOD OF ULTRASONIC MEASUREMENTS

Boris Vasilievich Tomilov, ulitsa Chkalova, 9, kv. 74, Khabarovsk, U.S.S.R.

Filed Apr. 5, 1974, Ser. No. 458,400
Int. Cl.² G01N *29/00*
U.S. Cl. 73—67.7 2 Claims

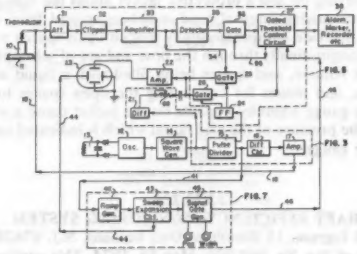
1. A method of ultrasonic measurements for the purpose of non-distructive testing of solid materials and articles, comprising the steps of placing an electromechanical converter in intimate acoustic contact with the article being tested under a constant pressure, imparting mutual vibratory oscillations to said electromechanical converter while; passing an ultrasonic test signal to said article through said converter; observing the rate of change of the amplitude of said test signal and discontinuing said mutual vibratory oscillations to said converter upon an abrupt decrease in the rate of change of said ultrasonic test signal amplitude, and subsequently measuring the parameters of said test signal which carry information on the properties of the article being tested.



3,972,228
ULTRASONIC NON-DESTRUCTIVE PULSE TESTING APPARATUS

Sven E. Mansson, Hollviksnas, Sweden, assignor to Magnetic Analysis Corporation, Mount Vernon, N.Y.

Filed July 15, 1974, Ser. No. 488,473
Int. Cl.² G01N *29/04*
U.S. Cl. 73—67.7 17 Claims

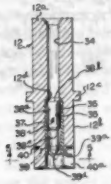


3. Ultrasonic non-destructive pulse testing apparatus which comprises
a. pulse generator and transducer means for applying ultrasonic pulses to an object to be tested,
b. means for receiving signals corresponding to variations or defects in an object under test,
c. cathode-ray tube means for displaying received signals,
d. and sweep generator means for producing sweeps of adjustable expansion for said cathode-ray tube means,
e. said sweep generator means including means for generating initial ramps of predetermined amplitude and including limiter means having a limit level less than said predetermined amplitude,
f. variable attenuator means supplied with said initial ramps and having an output connected to said limiter means for limiting portions of the ramps to a constant level and produce sweeps of adjustable time duration,
g. and means for amplifying and supplying the sweeps to said cathode-ray tube means.

3,972,229
HARDNESS TESTING PROBE ASSEMBLY

Rowland J. Kopf, Southington, Conn., assignor to Rowland J. Kopf and Madeleine E. DiSantis, both of Elmwood, Conn.

Continuation of Ser. No. 410,958, Oct. 29, 1973, Pat. No. 3,894,426. This application Nov. 11, 1974, Ser. No. 522,475
Int. Cl.² G01N *3/40*
U.S. Cl. 73—85 **1 Claim**

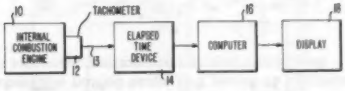


1. A probe pin assembly for making a penetration test of a homogeneous ceramic material using a powder actuated gun to drive said probe pin assembly, said probe pin assembly consisting of a metal cylinder tube having its ends cut off at right angles to the axis of said cylindrical tube, a generally cylindrical probe pin of hardened steel having a driving fit inside of said tube, the driving end of said pin having a flat surface at right angles to its cylindrical axis exactly at the level of one end of said tube, the other end of said pin having a cone shape penetration nose, and the overall length of said pin being exactly the same length as said tube, whereby after driving said probe pin into said ceramic material, the penetration can be measured by measuring the distance said flat surface has been driven into said tube.

3,972,230
DETECTING MALFUNCTION IN CYLINDERS OF INTERNAL COMBUSTION ENGINES

Richard Eric Hanson, Winchester, and William Fulmer Fordyce, Arlington, both of Mass., assignors to RCA Corporation, New York, N.Y.

Filed June 19, 1975, Ser. No. 588,385
Int. Cl.² G01M *15/00*
U.S. Cl. 73—116 **7 Claims**



4. The method of detecting malfunctioning in individual cylinders of an internal combustion engine, comprising the steps of:

measuring the engine power time periods between crankshaft positions representing successive ignition times in successively fired cylinders of the engine,

subtracting each measured time period from the following measured time period to determine individual deceleration rates between successive time periods,

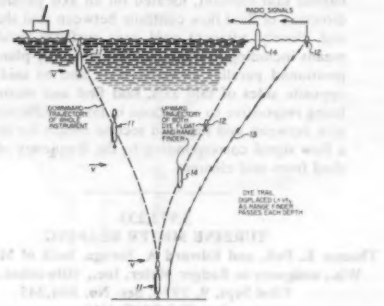
computing the average deceleration rate for each cylinder, and

comparing each individual deceleration rate with the average deceleration rate for the corresponding cylinder, and registering a misfire when the individual deceleration rate exceeds the average by more than a predetermined limit value.

3,972,231
METHOD FOR MEASURING VELOCITY AND DIRECTION OF CURRENTS IN A BODY OF WATER

William S. Richardson, Dania, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 19, 1975, Ser. No. 633,538
Int. Cl.² G01W *1/00*
U.S. Cl. 73—170 A **6 Claims**



1. A method for measuring velocity and direction of currents in a body of water comprising the steps of,

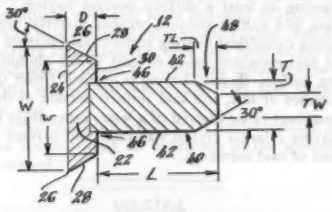
first depositing a vertical trail of dye in a body of water having a current, said trail of dye being deposited from a moving vehicle traveling a path through said body of water, and

then, after a time period, traversing a second moving vehicle over the same path said first moving vehicle traveled and measuring from said second moving vehicle the positions of said vertical trail of dye at a plurality of depths to determine speed and directions of currents at a plurality of depths.

3,972,232
VORTEX FLOW METER APPARATUS

Richard W. Miller, Foxboro; Gerald L. Felton, North Attleboro, and Kenneth W. Petros, Norton, all of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed Apr. 24, 1974, Ser. No. 463,522
Int. Cl.² G01F *1/32*
U.S. Cl. 73—194 VS **18 Claims**



1. Flow-measuring apparatus comprising:

a vortex-generating element adapted to be mounted in a stream of flowing fluid;

said element having a blunt, smooth front face free from discontinuities and extending out laterally to relatively sharp, parallel side edges defining a line of joinder between said front face and the portions of said element which are downstream of said front face, said sharp side edges being capable of producing corresponding spaced rows of vortices;

said downstream portions of said element including symmetrical side surfaces extending downstream from said side edges a distance substantially less than the lateral width of said front face;

said side surfaces being tapered inwardly at a moderate angle with respect to a line perpendicular to the effective plane of said front face and terminating at rear surfaces extending generally perpendicularly to said direction of fluid flow; and

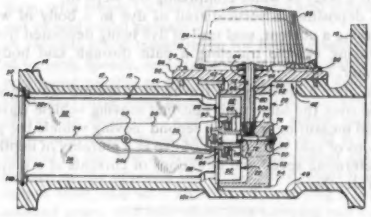
sensing means mounted in position downstream of and behind said element, located on an axis parallel to said direction of fluid flow centrally between said sharp edges and closely adjacent said rear surfaces, said sensing means including first and second generally-planar means positioned parallel to each other and to said axis, on opposite sides of said axis, said first and second means being responsive to variations in lateral differential pressure between said first and second means for developing a flow signal corresponding to the frequency of vortices shed from said element.

3,972,233

TURBINE METER BEARING

Thomas E. Pelt, and Edward A. Seruga, both of Milwaukee, Wis., assignors to Badger Meter, Inc., Milwaukee, Wis.

Filed Sept. 9, 1974, Ser. No. 504,245
Int. Cl.² G01F *1/10*
U.S. Cl. 73—231 R **12 Claims**



1. A turbine meter including a conduit housing, an impeller, means including a bearing assembly disposed in said conduit housing and rotatably supporting said impeller in said housing for rotary response of said impeller to flow of fluid in said housing, and means responsive to the rotation of said impeller for indicating the flow of such fluid through said housing, said bearing assembly including first and second members having mating coaxial cylindrical bearing surfaces, each of said members having at least a surface portion having a crystalline structure of a unified alumina ceramic material providing the respective cylindrical bearing surface, said surface portion of one of said members being at least 99.9% alumina and said bearing surface thereof having a surface finish of about 7 microinches or less, and said surface portion of the other of said members being formed of a lesser percentage of alumina and having a larger crystal size than said surface portion of said one of said members.

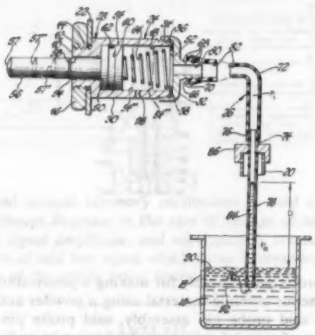
3,972,234

LIQUID LEVEL INDICATOR

Boris M. Osojnak, 4582 Arcata Road, Salt Lake City, Utah 84117

Filed Dec. 30, 1974, Ser. No. 537,366
Int. Cl.² G01F *23/00*; G01L *7/16*
U.S. Cl. 73—303 **16 Claims**

1. Liquid level gauging apparatus for gauging the level of a liquid within a related reservoir, comprising conduit means, said conduit means comprising first and second ends, said first end being adapted for insertion within said liquid to a first selected relatively low elevation, movable wall means generally closing said second end, and resilient means normally operatively engaging said movable wall means and urging said movable wall means in a direction generally away from said first end and toward a first normal position, said movable wall means being adapted for movement generally towards said first end and to a second position against the said urging of said resilient means whenever said level of said liquid is to be



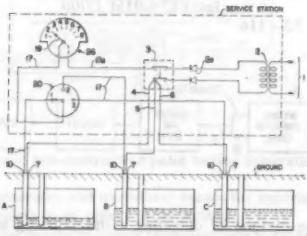
gauged, and said resilient means being effective to move said movable wall means from said second position to a third position generally between said first and second positions whenever said level of said liquid is elevationally above said first selected relatively low elevation, a portion of said liquid within said reservoir being drawn upwardly through said first end and into said conduit means a distance above said selected relatively low elevation in order to maintain said movable wall means in said third position.

3,972,235

SYSTEM FOR DETERMINING THE AMOUNT OF LIQUID IN A TANK OR SERIES OF TANKS

David A. Frayer, 24250 Lake Shore Blvd., Euclid, Ohio 44123

Filed Feb. 13, 1973, Ser. No. 332,086
Int. Cl.² G01F *23/06*
U.S. Cl. 73—311 **2 Claims**



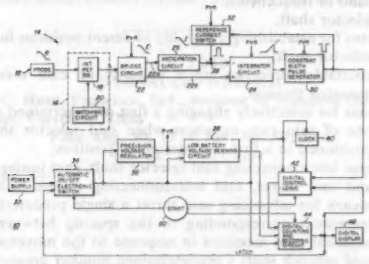
1. In a system including a source of electrical energy of the direct current type, a voltage reducing transformer, and a galvanometer provided with a scale, a permanent magnetic field, a rotatable electrical filament carrying a pointer which passes over said scale, and an iron core having a fine wire winding arranged in said magnetic field, said system also including a series of tanks, each containing a liquid and within each of which is a vertical container having a lower perforated portion for receiving liquid from the respective tank into which it extends, a closure for the lower end portion of each of said perforated containers and first and second electrical conductors, each having a comparatively high electrical resistance, arranged in each of said containers and having their

lower ends embedded and fixed in spaced relation in the closure of that container, a first multiple switch, electrically conductive means leading from said switch to each of said first conductors in each of said perforated containers, said voltage reducing transformer being arranged between and electrically connected to the source of electrical energy and to the first multiple switch, a float movable on the liquid in each perforated container through which float said first and second electrical conductors extend for guiding the movement of said float, electrically conductive means carried by the upper surface of each float which is arranged in electrical contact with the first and second conductors at a short distance above the liquid therein, a second multiple switch, a plurality of third electrical conductors, each of which is selectively connected to the upper end of the second conductor in each of the perforated containers and each of the third electrical conductors being electrically connected from the second multiple switch to the coil of said galvanometer which coil when energized is rotatable in a clockwise direction to rotate said pointer in a like direction over said scale, electrically conductive means selectively connected from the upper end of the second conductor of each of the perforated containers for energizing said coil and the total electrical resistance of the first and second conductors above the liquid in each of the perforated containers being such that the position of said pointer on said scale for each tank designates the amount of liquid in thousands of gallons in that particular tank.

3,972,236
INTERNAL TEMPERATURE REFERENCE CIRCUIT FOR ELECTRONIC THERMOMETER

Robert Bruce Turner, Weymouth, Mass., assignor to American Medical Electronics Corporation, Weymouth, Mass.

Filed May 28, 1974, Ser. No. 473,495
Int. Cl.² G01K 7/20
U.S. Cl. 73—362 AR **3 Claims**

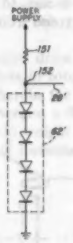


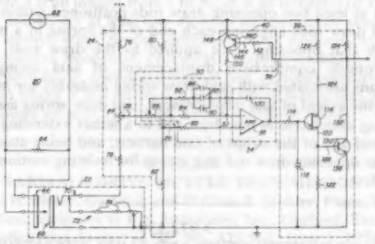
1. An electronic thermometer system comprising:
a temperature sensing probe unit having an electrical characteristic which varies as a function of the temperature to which it is exposed;
an electronic thermometer unit including a bridge circuit responsive to said probe unit to provide an electrical signal representative of temperature;
an internal temperature reference circuit including a probe matching circuit permanently located in said bridge circuit in said thermometer unit having the same said characteristic as said probe unit and initially settable to permanently match said characteristic of said probe unit at a predetermined test temperature; and a switching mechanism, located in said thermometer unit, for selectively interconnecting said probe matching circuit with said bridge circuit in place of said probe unit; and
a digital display device included in said thermometer unit for displaying, in response to the interconnection of said probe matching circuit with said bridge unit, said test temperature when said thermometer unit is operating properly and another temperature when said thermometer unit is operating improperly.

3,972,237
ELECTRONIC THERMOMETER

Robert Bruce Turner, Weymouth, Mass., assignor to American Medical Electronics Corporation, Weymouth, Mass.

Filed May 28, 1974, Ser. No. 473,494
Int. Cl.² G01K 7/24
U.S. Cl. 73—362 AR **2 Claims**





1. An electronic thermometer system comprising:
a temperature sensing circuit for providing an analog signal representative of the temperature being sensed;
a voltage to rate converter circuit responsive to said analog signal for providing constant width and amplitude pulses at a repetition rate which is proportional to the temperature being sensed, including an integrating circuit, having a first input for receiving said analog signal and a second input for receiving a reference input, responsive to a difference between said first and second inputs for providing a voltage proportional to that difference; a pulse generating circuit for producing pulses of constant width and amplitude, each said pulse provided in response to a predetermined output level of said integrator; and a feedback circuit for introducing each said pulse to one of said first and second inputs to reduce the difference between said first and second inputs and reset said integrating circuit; and
means for counting said pulses for a predetermined period of time for providing an indication of the temperature being sensed.

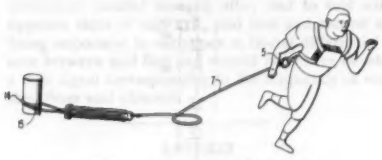
3,972,238
PHYSICAL CONTACT TRAINING APPARATUS

Richard Eugene Thatcher, 10709 Lunswood Road, Chester, Va. 23831

Filed July 10, 1975, Ser. No. 594,698
Int. Cl.² G01L 5/02
U.S. Cl. 73—380 **5 Claims**

1. A teaching and conditioning apparatus to be used by a person such as an athlete comprising an adjustable upper-body harness attachably associated by means of a tether to a

draw spring assembly, and means for measuring force imparted to same, said harness comprising two essentially equal lengths of strap which at one end are joined and at the other end engaged with a ring, said straps being held in crossed juxtaposition by channel guide means slideably positionable on said straps between said joined end and said ring, said straps being adapted to pass through said ring at a lower portion thereof so as to form an upper pair of loops and lower pair of loops, said upper pair of loops, extending from the ring to the channel guide means, being adapted to accomodate the shoulders of the athlete and said lower pair of loops, extending from the channel guide means to said lower portion of said ring, being designed to extend from the chest, around the side



and to the back of the athlete, said loops being simultaneously tightenable by tension applied from the direction of said joined end, said draw spring assembly comprising a coil spring and at least two opposing draw rods positioned within same, said draw rods engaging each end of the spring in a manner such that opposing force applied to the draw rods causes restorable compressive displacement of said spring, and means associated with said draw spring assembly for measuring the extent of said displacement, said draw spring assembly being attachable at one draw rod to a tether extending to the joined end of the straps of said harness, and being attachable at an opposing draw rod to a means for resisting motion of the athlete.

3,972,239

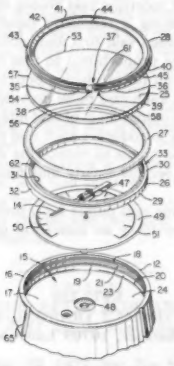
GAGE CONSTRUCTION AND PARTS THEREFOR OR THE LIKE

Louis M. Puster, and Larry V. Price, both of Knoxville, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 290,477, Sept. 20, 1972, Pat. No. 3,844,442. This application Aug. 22, 1974, Ser. No. 499,528

Int. Cl.² G01D *11/26*; G04B *39/00*

U.S. Cl. 73—431 **1 Claim**



1. In combination, pointer mean for an instrument casing having an opening therein, a flexible sealing member carried by said casing adjacent said opening thereof, a lens disposed in said opening and having one side of its outer periphery disposed against said sealing member, and a lens ring means disposed against the other side of the outer periphery of said lens to hold said lens in said opening, said lens ring means having an interlocking part thereof disposed against the outer peripheral edge means of said lens between said sides thereof to lock said lens ring means to said casing, said casing carrying a spacing member in said opening, said sealing member engaging said spacing member and being disposed between said spacing member and said lens, said casing having an end wall closing said opening, an opening in the end wall for receiving the pointer means, said spacing member being disposed against said end wall and having an internal peripheral recess therein facing said end wall, and a dial plate disposed adjacent the top surface of said end wall and having its outer periphery received in said recess.

3,972,240

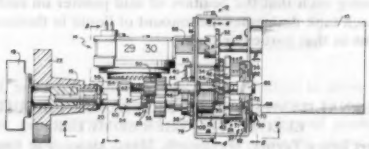
DETENT UHF TUNER WITH PRESET MEMORY

Alarico A. Valdettaro, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Filed Aug. 26, 1974, Ser. No. 500,450

Int. Cl.² F16H *35/18*

U.S. Cl. 74—10.41 **41 Claims**



1. A tuning system including in combination:

a tuner having a continuously variable tuning shaft, rotation of which is effective to tune said tuner over a continuous band of frequencies;

a selector shaft;

means for establishing a plurality of detent positions for said selector shaft;

a rotatable turret having a plurality of cam members mounted thereon;

means for selectively engaging a first predetermined single one of said cam members when said selector shaft is positioned in a first predetermined position;

means interconnecting said selector shaft, said tuning shaft and said turret, said interconnecting means including means for advancing said turret a single predetermined increment corresponding to the spacing between two adjacent cam members in response to the movement of said selector shaft a predetermined number greater than one of successive detent positions to bring a second one of said cam members into position for selective engagement by said engaging means; and

cam follower means operatively coupling the cam member positioned for engagement by said engaging means to said tuner for adjusting said tuner in response to the rotation of one of said cam members to effect fine tuning of said tuning system.

3,972,241

UHF TUNER ARRANGEMENT

Alarico A. Valdettaro, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

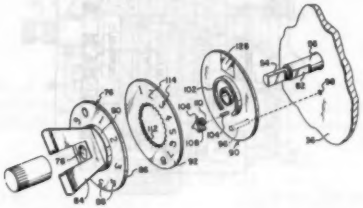
Division of Ser. No. 350,742, April 13, 1973, Pat. No. 3,842,683, which is a continuation of Ser. No. 174,722, Aug. 25, 1971, abandoned. This application Oct. 16, 1974, Ser. No. 515,220

Int. Cl.² F16H *35/18*

U.S. Cl. 74—10.54 **4 Claims**

1. The combination of, a UHF tuner having a continuously variable main tuning shaft rotation of which is effective selec-

tively to receive signals from all television stations in the UHF television band, a selector shaft, a detent wheel secured to said selector shaft and having ten indentations in the periphery thereof, spring biased detent means adapted to engage the indentations of said wheel as said selector shaft is rotated, thereby to establish ten different equally spaced detent positions for said selector shaft, a units dial member mounted on and rotatable with said selector shaft, a tens dial member concentric with said selector shaft, means interconnecting



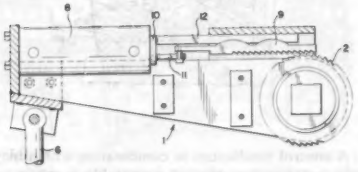
said tens and units dial members so that said tens dial member is changed one tens digit position for each rotation of said units dial member, a masking member positioned behind said tens dial member, said masking member having a viewing area which contrasts with the numbers carried by said tens and units dial members while other areas of said masking member have relatively little contrast with said numbers, whereby said dial numbers may be viewed in ambient light and only the desired channel number is readily visible in said viewing area.

3,972,242

HYDRAULIC WRENCH

Roy C. Hunt, Francisco, Ind., assignor to Standard Oil Company, Cleveland, Ohio

Filed Aug. 30, 1974, Ser. No. 502,084
Int. Cl.² F16H *19/04*
U.S. Cl. 74—30 **2 Claims**



1. A high torque wrench apparatus comprising a rack and ratchet, said ratchet being operatively connected to a wrench, said rack being linearly reciprocally forwardly and backwardly operative by hydraulic means, said rack being part of a hydraulic ram, said ram also being equipped with a lock-down cam, said lock-down cam being slidably raised or lowered by means of a retract plate on respective forward or backward movement of the ram so that when the ram moves in a forward direction the lockdown cam forces the rack to engage and drive the ratchet, and when the ram moves in a backward direction the lock-down cam releases the rack from engagement with the ratchet.

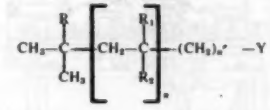
3,972,243

TRACTION DRIVE WITH A TRACTION FLUID CONTAINING GEM-STRUCTURED POLAR ORGANO COMPOUND

Gary L. Driscoll, Boothwyn, and Marcus W. Haseltine, Jr., Brookhaven, both of Pa., assignors to Sun Research and Development Co., Marcus Hook, Pa.

Continuation-in-part of Ser. Nos. 135,295, April 19, 1971, Ser. No. 144,165, May 17, 1971, Pat. No. 3,715,313, and Ser. No. 152,303, June 11, 1971, Pat. No. 3,793,203. This application July 23, 1973, Ser. No. 381,634
Int. Cl. F16h *15/08*
U.S. Cl. 74—200 **16 Claims**

1. In a friction or tractive drive comprising at least two relatively rotatable members in torque transmitting relationship, the improvement wherein the tractive surfaces of said members have disposed thereon a fluid tractant composition comprising from 1.0 to 100 weight percent of a polar compound having the structural formula:



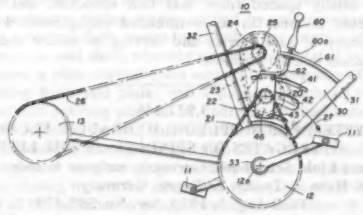
wherein n is an integer from 1 to 30, n' is an integer 0 or 1 and R, R_1 and R_2 are at least one member independently selected from methyl, ethyl, propyl, isopropyl, butyl, isobutyl, tertbutyl, isopentyl, neopentyl, cyclohexyl, methylcyclohexyl, indanyl, hydrindanyl, cyclohexylindanyl and cyclohexylhydrindanyl and where Y is a functional group which makes said polar compound an acyl hydrazide, oxime, amide or imine.

3,972,244

VARIABLE DRIVE BICYCLE TRANSMISSION

Albert H. Bieser, Garland, and William B. Stuhler, Plano, both of Tex., assignors to B.E. Industries, Inc., Garland, Tex.

Continuation-in-part of Ser. No. 475,561, June 3, 1974, abandoned. This application May 13, 1975, Ser. No. 577,023
Int. Cl.² F16H *9/00, 55/54*
U.S. Cl. 74—217 B **17 Claims**



1. An apparatus for varying the mechanical advantage in the power train of a bicycle comprising:

drive means attached to one wheel of the bicycle for driving said wheel,

a fixed pitch sheave mounted on the bicycle frame and operatively connected to said drive means,

a rotatable variable pitch sheave mounted to move relative to said fixed pitch sheave,

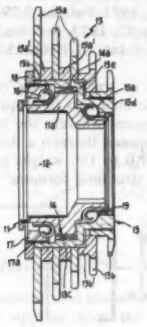
means for operatively connecting said fixed pitch sheave and said variable pitch sheave in a driving and driven relation, respectively, and

pedal means rotatably mounted on the bicycle frame and operatively connected rotationally to drive said variable pitch sheave and for moving said variable pitch sheave relative to said fixed pitch sheave for varying the mechanical advantage therebetween.

3,972,245
BICYCLE FREEWHEEL

John Michael Allen, Southwell, England, assignor to Raleigh Industries Limited, Nottingham, England

Filed Aug. 20, 1974, Ser. No. 499,067
Int. Cl.² F16H 11/04; F16D 41/18; F16H 7/10
U.S. Cl. 74—243 R 3 Claims



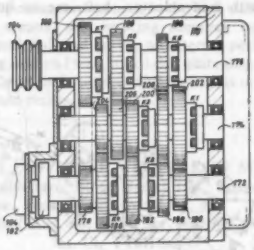
1. A Derailleur block for a cycle wheel comprising in combination, sleeve-like means adapted to be rigidly secured to the hub of said cycle wheel, outwardly-facing inboard and outboard peripheral formations on said sleeve-like means each defining one part of a ball race, a sprocket carrier, an internal inwardly-facing formation on said carrier complementary to said outboard peripheral formation on said sleeve-like means to complete a ball race, a free-wheeling mechanism between said sleeve-like means and said sprocket carrier, a cone, in screw-threaded adjustable engagement with the interior of said sprocket carrier at the inboard end thereof, a formation on said cone complementary to the said inboard peripheral formation of said sleeve-like means to complete another ball race, balls in said ball races, a lock nut in adjustable screw-threaded engagement with the exterior of said cone and forming an abutment at one end of said carrier, a first sprocket mounted on said carrier in engagement with said abutment, a plurality of intermediate sprockets mounted on said carrier and axially spaced from said first sprocket, and a final sprocket member in screw-threaded engagement with the periphery of said carrier and serving to secure the other sprockets in axial position.

3,972,246
SYSTEM FOR SUPPLYING HYDRAULIC FLUID TO AGGREGATES ON SPINDLES OR THE LIKE

Helmut Link, Schanbach, Germany, assignor to Index-Werke KG Hahn & Tessky, Esslingen, Germany

Filed Aug. 3, 1973, Ser. No. 385,479
Claims priority, application Germany, Aug. 8, 1972, 2238986
Int. Cl.² F16H 3/10, 3/08
U.S. Cl. 74—360 7 Claims

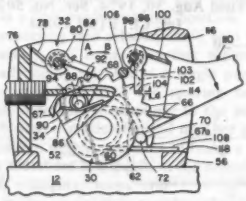
1. In a transmission, a combination comprising a housing; three parallel hollow shafts rotatably mounted in said housing and including an input shaft, an output shaft and a third shaft, said shafts being equally spaced from each other and from a central axis; means for rotating said input shaft; a plurality of gears on each of said shafts, said gears forming a plurality of gear trains for rotating said output shaft at a selected one of several speeds and each of said gear trains including a first gear on one of said shafts and a second gear rotatable on another of said shafts, there being at least two second gears on each of said shafts; a plurality of hydraulic clutches, one for each of said second gears; and control means for selectively actuating said clutches to thereby couple the respective second gears to the associated shafts and to rotate said output shaft in response to rotation of said input shaft on actuation of several clutches to thus achieve an acceleration of said output shaft to a selected speed, said control means including valves mounted in said shafts and having valve members movable axially of the respective shafts, each of said valve members having a portion extending from the respective shaft, displacing means cooperating with said portions of said valve members and means for operating said displacing means to move said valve members axially of the respective shafts.



3,972,247
BICYCLE SHIFT MECHANISM

Allen E. Armstrong, 4 Turning Mill Road, Lexington, Mass. 02173

Filed Sept. 23, 1974, Ser. No. 508,042
Int. Cl.² G05G 9/00; B23P 7/00; F16C 1/10; G05G 1/00
U.S. Cl. 74—489 33 Claims



31. A control mechanism in combination with a bicycle for effecting rotational motion of a rotatable member rotatably supported by a support means on said bicycle, the improvement comprising bias means connected to said rotatable member to normally urge said rotatable member in one direction of rotation, first means mounted on said support means for selective engagement with said rotatable means and for movement from a rest position to at least a first position and a second position, said first means being movable to said first position to disengage said first means from said rotatable member whereby said rotatable member is free to rotate in said one direction of rotation under the force of said bias means, said first means engaging drivingly said rotatable member in response to movement thereof past said first position to said second position to move said rotatable member in the opposite direction of rotation.

3,972,248

RACK AND PINION STEERING MECHANISM

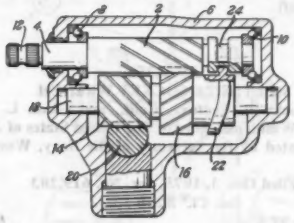
Frederick John Adams, Campton, England, assignor to Cam Gears Limited, Hitchin, England

Filed Apr. 24, 1975, Ser. No. 571,290

Claims priority, application United Kingdom, May 7, 1974, 20046/74

Int. Cl.² B62D 1/20; F16H 1/04

U.S. Cl. 74—498 8 Claims



1. A rack and pinion steering mechanism for a vehicle, comprising an axially fixed rotatable primary pinion intended for rotation with the vehicle steering wheel, a secondary pinion rotatable in response to the primary pinion to effect displacement of an engaged rack, and cam means responsive to rotation of the primary pinion to effect axial displacement of the secondary pinion during its rotation, in which rotary drive is transmitted from said primary pinion to said rack by at least one set of mutually engaging helical teeth whereby said axial displacement of the secondary pinion produces a variation in the movement ratio between the first pinion and the rack.

3,972,249

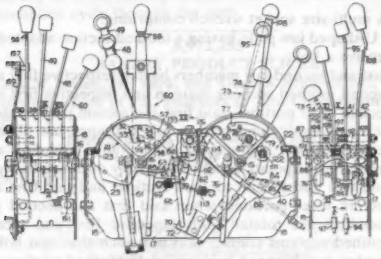
MULTIPLE LEVER CONTROL CONSOLE

Kenneth N. Hansen, Waukesha, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 11, 1975, Ser. No. 603,659

Int. Cl.² G01P 3/00

U.S. Cl. 74—526 10 Claims



1. A multiple lever control console comprising, a plurality of levers, a plurality of spacers alternately spaced between said levers, pivotal support means defining a pivotal axis pivotally supporting said levers and carrying said spacers, a housing carrying said pivotal support means forming an opening radially spaced from said pivotal axis and receiving said levers and said spacers, each of said levers defining an arcuate segment of uniform thickness mounted on said pivotal support means, said arcuate segments of said levers and said spacers axially spaced on said pivotal axis to close said opening in said housing, said housing covering the end portions of said arcuate segments in any position of said levers with said end portion selectively and alternatively rotating inwardly and outwardly of said housing as each of said levers is pivoted, said spacers engaging said arcuate segments adjacent said pivotal axis and radially spaced from said pivotal axis to maintain rotation alignment of said levers, means defining abutting surfaces on said arcuate segments, movement control means mounted on said housing engaging said abutting surfaces for limiting the rotational movement of said levers, connecting means connected to said arcuate segments of said levers for operating lever controlled means.

3,972,250

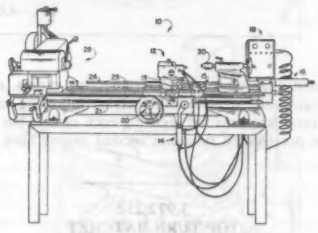
SINGLE POINT THREADING ATTACHMENT WITH LEAD-SCREW ROTATIONAL TIMING MEANS

William B. Reynolds, 1128 Gatewood, SW., Albuquerque, N. Mex. 87105

Filed Sept. 2, 1975, Ser. No. 609,212

Int. Cl.² B23B 1/00

U.S. Cl. 82—5 5 Claims



1. In a single point threading apparatus for cutting threads in a workpiece carried upon an engine lathe having a head stock for rotatibly carrying the workpiece, a lead-screw rotated in conjunction with the rotation of said workpiece by said head stock, a carriage including half-nut means for controllably engaging said lead-screw to advance said carriage along side said workpiece, ways upon which said carriage slides, a cutting tool carrying assembly for advancing the cutting tool into the workpiece increasingly with each pass of the carriage therealong, means for returning said carriage to an initial location upon said ways in preparation of a subsequent cutting pass, and means for controlling the number of cutting passes made by the carriage, wherein the improvement comprises, pneumatic half-nut closing means carried by said carriage to move said half-nut means to between open and closed positions: timing means carried by said carriage, including, a central shaft, means for coupling the rotation of said lead-screw to said shaft, whereby said shaft is rotated by said lead-screw, a plate carried upon said shaft, a plurality of pins upstanding from said plate, and a pair of switches carried adjacent said rotating plate to be operated by the passing of said pins adjacent thereto, said switches being located opposite each other by an angle larger than 180°; and a circuit for activating said tool carrying assembly and said pneumatic half-nut closing means for advancing said carriage upon the closure of the switches in a sequence in the direction of rotation, whereby the advance of the carriage along said ways and of the cutting tool into the workpiece is synchronized with the rotation of said lead-screw.

3,972,251

ADJUSTABLE LATHE TEMPLATE

Thomas E. Gorman, Springfield, Mass., and Frederick O. Raley, Bristol, Conn., assignors to United Technologies Corporation, Hartford, Conn.

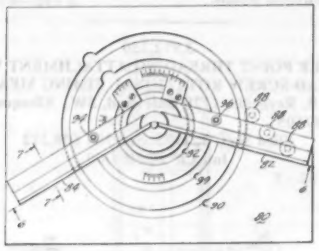
Filed Sept. 2, 1975, Ser. No. 609,859

Int. Cl.² B23B 3/28, 3/36

U.S. Cl. 82—14 R 9 Claims

1. An adjustable template for controlling an automatic feed of a lathe to position its cutting tool so as to cut into the workpiece two angles and an interconnecting radius, said template including a flat base member, upstanding member

having at least a partially circumferential edge, a pair of bar members rotatably supported to said base member and having a straight working edge that lies tangential to said partially circumferential edge, all of said edges defining the pattern cut by the cutting tool of said lathe which pattern includes a first



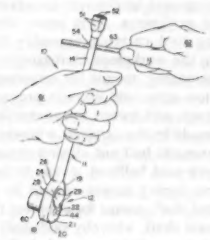
and second angle and an interconnecting radius, means for tracing said pattern including a stylus following said edges, and retractable means for securing each of said bar members once the preselected first and second angles have been adjusted.

3,972,252

TOP TURN RATCHET

John K. Hunter, 9035 O'Neil Drive, Hinsdale, Ill. 60521

Filed Jan. 12, 1976, Ser. No. 648,648
Int. Cl.[2] B24B *17/00*
U.S. Cl. 81—57.29 **5 Claims**



1. A top turn ratchet for providing easy access to nuts and bolts in tight places so that the nuts or bolts can be tightened or loosened with rotational force that is not impeded by obstacles adjacent to said nuts or bolts, the device comprising, in combination:

A handle constructed of durable metal tubing having an enlarged outside diameter to provide a gripping surface by the user's hand;

A gear housing being generally rectangular in shape with a rounded top surface to match the outside diameter of the handle to which the gear housing is securely affixed, such as by welding, a hollow interior compartment for assembly of the gear assembly therein, two round threaded holes on opposite sides of the gear housing to provide access to the interior compartment for assembly and maintenance of the gears therein, and with one of the walls also being provided with a round through hole for assembly of a gear shaft therethrough;

A gear assembly consisting of two beveled gears with the primary gear attached on its flat surface to a length of tubing for attachment to the end of the drive shaft with a set screw thereto, and a drive gear to which a round shaft is attached centrally on one end for positioning through a round hole in the gear housing and with a square shaft attached to the other end of the gear protruding externally from the gear housing for attachment of a conventional socket thereto for loosening or tightening bolts or nuts; and

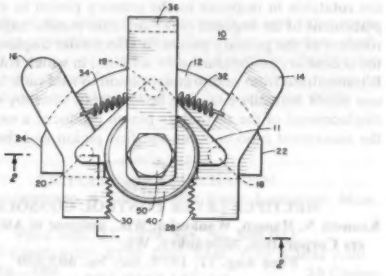
A drive shaft consisting of a length of durable metal rod which is secured on one end to the primary gear and is provided on the other end with a square piece of tubing for turning of the drive shaft by means of conventional wrenches and with the drive shaft being provided with a round through hole for insertion of a round shaft therethrough to provide a T-shaped handle for turning of said drive shaft.

3,972,253

MULTI-SIZE SOCKET WRENCH

Philip K. Rockwell, Ventura, Calif., and Glenn L. Liffick, Richland, Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 3, 1975, Ser. No. 619,283
Int. Cl.[2] B25B *13/32*
U.S. Cl. 81—91 C **6 Claims**



1. A multi-size socket wrench comprising:

a. a U-shaped jaw plate having a toothed section adapted to receive a bolt;

b. first and second jaw members having respective first and second toothed sections thereon and respective first and second lever portions, said first and second jaw members being rotatably connected to said U-shaped jaw plate at respective first and second pivot points, said first and second pivot points being respectively disposed between said first and second toothed sections and said first and second lever portions, when said first and second jaw members are rotated said respective first and second toothed sections contact said bolt such that said bolt is sandwiched between said jaw plate toothed section and said jaw member toothed section;

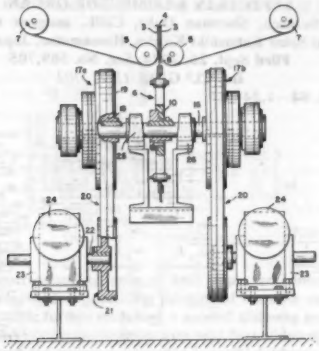
c. means rotatably connected to said jaw plate and disposed to contact said first lever portion when rotated clockwise and said second lever portion when rotated counterclockwise for forcibly rotating one said jaw member with respect to said jaw plate such that said rotated jaw member toothed section contacts said bolt, thereafter said means increases the pressure exerted on said bolt between said jaw plate toothed section and said rotated jaw member toothed section such that said bolt is rendered immovable with respect to said jaw plate toothed section and said rotated jaw member toothed section, said jaw member rotating means also serving to transmit a torque to said bolt through said jaw plate and said jaw member substantially about said bolt's longitudinal axis.

3,972,254

CUTTING MECHANISM AND METHOD FOR CUTTING OR SLICING STRIPS FED THERETO

Edward George Dillinger, Levittown, Pa., and Wallace Jared Camp, Willingboro, N.J., assignors to Kemos Incorporated, Marietta, Ga.

Filed Jan. 20, 1975, Ser. No. 542,483
Int. Cl.² B26D *1/46, 3/28*
U.S. Cl. 83—4 **10 Claims**



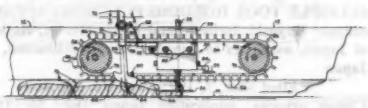
1. A cutting device comprising belt means movable lengthwise through an endless path or loop having an upper course and a lower course, a plurality of planar cutting blades secured to the belt means, spaced longitudinally therealong and projecting outwardly therefrom in a common plane, means for supporting the belt means for longitudinal movement in either direction in its path comprising (a) spaced rotary means engaging the inside periphery of the belt means at the ends of the upper course and (b) stationary guide means under the upper course in a position to guide and support the belt means in a substantially straight line along the upper course, and means for reciprocating the belt means longitudinally in its path, wherein the reciprocating means comprises means for moving the belt different forward and return stroke distances, whereby all of the cutting blades on the belt periodically make a complete cycle through the path.

3,972,255

BAKERY PRODUCT SLICER

Frank M. Irving, Jr., York, and Albert S. Schmidt, Sr., Wormleysburg, both of Pa., assignors to Alto Corporation, York, Pa.

Filed Sept. 15, 1975, Ser. No. 613,260
Int. Cl.² B26D *1/28, 3/08*
U.S. Cl. 83—4 **9 Claims**



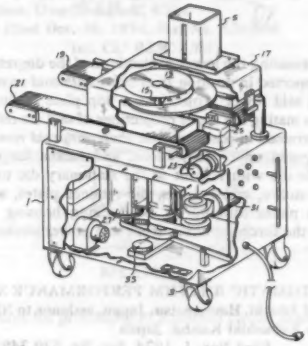
1. A bakery product slicer for forming slits in clusters of buns or the like as they are moved on a surface downstream past the bakery product slicer, the bakery product slicer comprising a support above the surface, a horizontal slicer having a vertical rotary shaft journaled in and held by the support, a rotary cutting blade on the lower end of the shaft and a drive for rotating the shaft and blade, and a vertical slicer on the support located upstream from the horizontal slicer and including a pendent holder suspended from the support, a head at the lower end of the holder, a connection between the upper end of the holder and the support permitting lateral movement of the head, the head including orienting means engagable with a crease in a bakery product cluster above a proof line so that as the cluster moves past the slicer lateral shifting of the crease moves the head laterally to follow the crease and a vertical slicing blade located downstream of the orienting means and further away from the support than the orienting means, the downstream end of the vertical slicing blade being positioned immediately upstream from the rotary cutting blade whereby as bakery product clusters move downstream past the bakery product slicer the vertical slicer cuts a vertical slit in the bakery product clusters following proof lines and the horizontal slicer cuts horizontal slits in the clusters to either side of the proof lines.

3,972,256

MEAT SLICER

Henry M. Ross, The Lawn, Nokesville, Va. 22123

Filed May 30, 1975, Ser. No. 582,149
Int. Cl.² B26D *4/22, 4/46, 7/06*
U.S. Cl. 83—155 **1 Claim**



1. A meat slicer comprising
a horizontally disposed crescent-shaped plate member mounted for rotation about a central axis,
a pair of hopper members removably mounted above and perpendicular to the surface of said crescent-shaped plate member, said hopper members being adapted to contain elongated portions of meat to be sliced,
a circular blade member mounted concentrically with said crescent portion between said plate member and said hopper members and parallel to
said crescent-shaped plate member, the axis of said circular blade member being parallel to, spaced from and in fixed relationship to said central axis,
a conveyor for each hopper member mounted below said crescent-shaped plate member and in alignment with said hopper member,
means to rotate said crescent-shaped plate member and said circular blade member about said central axis, and
means to rotate said circular blade member about its own axis while said blade member is rotating about said central axis,
whereby meat in each of said hopper members rests upon said crescent-shaped plate member and is sliced by said circular blade member to fall through the crescent portion of said plate member onto said conveyor.

3,972,257

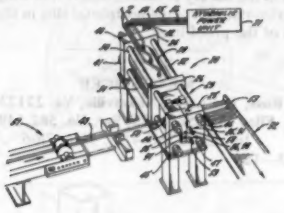
BAR STOCK SHEAR

John Daniel Lazar, Jr., 1007 River Drive, Munster, Ind. 46321

Continuation of Ser. No. 532,300, Dec. 12, 1974, abandoned.
This application Sept. 15, 1975, Ser. No. 613,237
Int. Cl.² B26D *5/12, 3/20*
U.S. Cl. 83—198 **18 Claims**

8. A die housing for a bar stock shear comprising in combination a pair of bolsters forming the ends of the die housing, infeed and outfeed die retainer plates forming the sides of the die housing, the bolsters including recesses for receiving

the die retainer plates, the edges of the die retainer plates forming protrusions fitting into the bolster recessers, tie rods joining the bolsters and serving to securely fix the die retainer plates in position in the respective bolster recesses, a stationary die fixed in position within the die housing, a movable die cooperating with the stationary die and mounted for reciprocation within the die housing, the die retainer plates each including upper projections projecting above the dies and lower projections projecting below the dies, a bottom plate having a pair of



recesses mating the lower projections of the die retainer plates and supported in position *from below with said recesses* encompassing said lower projections, a top plate having a pair of recesses mating the upper projections of said die retainer plates and restrained in position *from above with said recesses* encompassing said upper projections, and means for moving the movable die with respect to the stationary die to produce a power stroke, said bolsters, die retainer plates, and top and bottom plates forming an interlocking housing adapted to absorb the forces resulting from said power stroke.

3,972,258

AUTOMATIC RHYTHM PERFORMANCE SYSTEM

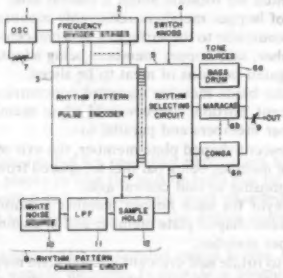
Takeshi Adachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Nov. 1, 1974, Ser. No. 520,349

Claims priority, application Japan, Nov. 7, 1973, 48-125088

Int. Cl.² G10H *1/00, 5/00*

U.S. Cl. 84—1.03 **5 Claims**



1. In an automatic rhythm performance system of the type comprising a rhythm pattern forming circuit for developing rhythm pattern signals representative of a variety of rhythm patterns; a rhythm selecting circuit receptive of said rhythm pattern signals and operable for selecting different ones of the received rhythm pattern signals; and a plurality of percussion tone generating sources responsive to rhythm pattern signals and connected to said rhythm selecting circuit for receiving said selected rhythm pattern signals to develop percussion tone signals having rhythms determined by said selected rhythm pattern signals; the improvement which comprises: said rhythm selecting circuit comprising means responsive to external electrical signals for applying to said percussion tone sources ones of said rhythm pattern signals determined by said electrical signals; and means for applying randomly occurring electrical signals to said means responsive to external electrical signals to enable said rhythm selecting circuit to apply random ones of said rhythm pattern signals to said percussion tone generating sources in response to the occurrences of said randomly occurring signals in order to develop percussion tone signals having rhythms determined by said selected rhythm pattern signals and by the occurrences of said randomly occurring electrical signals.

3,972,259

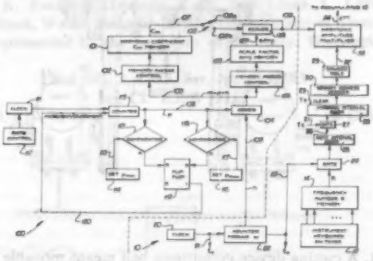
PRODUCTION OF PULSE WIDTH MODULATION TONAL EFFECTS IN A COMPUTOR ORGAN

Ralph Deutsch, Sherman Oaks, Calif., assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sept. 26, 1974, Ser. No. 509,705

Int. Cl.² G10H *1/02, 5/02*

U.S. Cl. 84—1.24 **11 Claims**



1. In an electronic musical instrument of the type including generation means wherein musical tones are generated by computing in real time the amplitudes at successive sample points of that waveshape, said waveshape amplitudes being converted to musical tones as the computations are carried out, said generation means including calculation circuitry for separately calculating the constituent Fourier components of a musical waveshape, and an accumulator for summing these components to obtain each waveshape sample point amplitude, and wherein the relative amplitude of each constituent Fourier component with respect to each other is established by a harmonic coefficient associated with the order of that component, the improvement for simulating the tonal quality of a repetitive pulse train having a particular pulse shape comprising;

coefficient supply means for providing a set of harmonic coefficient values that define the frequency spectrum of said pulse train of particular pulse shape, and

control means, connected to said coefficient supply means and to said generation means, for causing said supply means to provide a certain subset of said coefficient values to said calculation circuitry to establish said Fourier component relative amplitudes.

3,972,260

MULTIPLE TOOL HOLDING PUNCHING APPARATUS

Yoshiyuki Hayashi, Isehara, and Hideo Morita, Hatano, both of Japan, assignors to Amada Company Limited, Isehara, Japan

Filed Mar. 7, 1975, Ser. No. 556,408

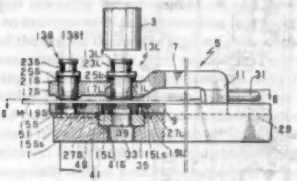
Claims priority, application Japan, Dec. 26, 1974, 49-156878

Int. Cl.² B26F *1/04*

U.S. Cl. 83—549 **2 Claims**

1. A punching apparatus comprising a work table disposed beneath a vertically movable ram, a tool holder having a body portion and including upper and lower arms each extending substantially horizontally from said body portion in vertically spaced alignment from one another to form a throat into which sheet material to be punched may be positioned, a plurality of upper tool-holding bores extending vertically through said upper arm the vertical axes of which being aligned with a vertical plane extending through the longitudinal axes of said arms, each of said bores being of a different

diameter, a plurality of upper tools of different diameters each of which is detachably mounted in one of said bores of corresponding diameter, a plurality of lower tool-holding bores extending vertically through said lower arm and being concentrically aligned with corresponding ones of said upper bores, a plurality of lower tools of different diameters each of which is detachably mounted in one of said lower bores of corresponding diameter for operatively receiving a corresponding upper tool during a punching operation, said work table having a first slideway formed therein extending beneath said ram, said tool holder being slidably mounted in said slideway

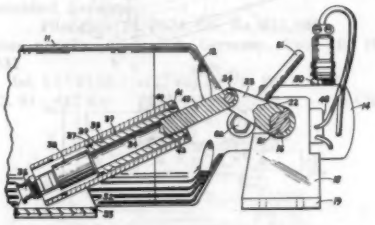


whereby corresponding ones of said upper and lower tools may be selectively operatively positioned beneath said ram, said work table further including a second slideway extending beneath and in communication with said first slideway, a slug discharging bore opening into said second slideway and extending vertically downwardly therefrom with its axis aligned with the axis of said ram, a lower tool supported member slidably mounted in said second slideway with its upper surface flush with said first slideway, and a plurality of spaced vertical holes of different diameters extending through said tool supporter member and adapted to be vertically aligned with said slug discharging bore.

3,972,261
ROCKET CATAPULT APPARATUS

Manuel Weinstock, Philadelphia, Pa., and Frank T. Pisano, Voorhees, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 3, 1974, Ser. No. 511,877
Int. Cl.² B64D *25/10*; F41F *3/06*
U.S. Cl. 89—1.813 **3 Claims**



1. A rocket catapult arrangement having a rocket nozzle portion of a rocket motor slidably mounted on a launch tube secured in a trunnion,

shaft means secured to said trunnion and journalled in a first base member,

a crank arm secured to said shaft means,

an erector cylinder freely journalled in a second base member and having a cartridge actuated piston slidable therein,

a piston rod secured to said piston and connected to said crank arm, and

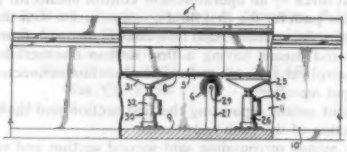
a locking ring expandabe in a forward internal surface of said cylinder,

said piston having an annular cam surface for expanding said ring and an annular groove in an external surface of said piston forward of its head portion for receiving said locking ring when the piston has completed its stroke and said tunnion and rocket motor have completed a predetermined amount of rotation with said crank arm, said first base member having a base portion and a pair of laterally spaced upright portions integral therewith said shaft means including a pair of diametrically opposed shaft portions, one of said shaft portions being journalled in one of said base upright portions, and the other of said shaft portions being journalled in the other of said base upright portions and having means securing said trunnion to said crank arm for movement with said other shaft portion.

3,972,262
PRINTED CIRCUIT BOARD SUPPORT

Eugene V. Albert, Jr., Overland Park, Kans., assignor to Q Corporation, Overland Park, Kans.

Filed Dec. 26, 1974, Ser. No. 536,638
Int. Cl.² B23C *1/08*
U.S. Cl. 90—19 **6 Claims**



1. Apparatus for processing of a printed circuit board comprising:

a. a frame having laterally spaced and longitudinally extending side members;

b. means on each of said frame side members for maintaining a printed circuit board carrier and the circuit board therein in a defined path during movement thereof through said frame, said means comprising;

1. a pair of laterally opposed and longitudinally extending guide bars, said guide bars having facing surfaces positioned at a selected spacing apart and adapted to be slidingly engaged by respective side surfaces of the carrier;

2. a pair of laterally spaced and longitudinally extending support bars each having an upwardly facing surface positioned at a selected elevation and adapted to be slidingly engaged by respective downwardly facing surfaces of the carrier;

3. a pair of laterally spaced and longitudinally extending upper bars each having a downwardly facing surface positioned in facing relation with the upwardly facing surface of a respective one of said support bars, the downwardly facing surfaces of said upper bars each being adapted to be slidingly engaged by respective upper surfaces of the carrier;

c. first cutting means mounted on said frame and positioned along the defined path for cutting leads depending from the printed circuit board to a first length;

d. means mounted on said frame and positioned adjacent said first cutting means for supporting and positioning the printed circuit board at a selected elevation during movement of the carrier and printed circuit board through said frame, said circuit board supporting means being adapted to permit the leads to pass therethrough; and

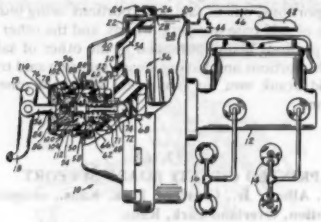
e. second cutting means mounted on said frame and positioned adjacent said means for supporting the printed circuit board for cutting leads depending from the printed circuit board to a second and shorter length.

3,972,263

FLOW CONTROL VALVE MEANS FOR A SERVOMOTOR

Harold H. Welsh, Jr., South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Feb. 19, 1975, Ser. No. 551,223
Int. Cl.[2] F15B 9/10, 21/04; F01B 25/02
U.S. Cl. 91—6 7 Claims



1. In a servomotor having a wall means movable in response to a first fluid flowing through a first flow path in a hub means upon movement of a control valve means to establish a pressure differential thereacross with a second fluid in response to an input force by an operator, flow control means for providing a flow path for the first fluid commensurate with the input force from the operator, said flow control means comprising:

push rod means having a first section connected to the control valve means and a second section connected to an input member;

resilient means separating the first section and the second section of the push rod means;

filter means surrounding said second section and substantially filling said hub means; and

projection means connected to the resilient means and the filter means, said input member transmitting an operational input force to the second section through the resilient means and to the first section for operating said control valve means to allow the first fluid to flow through the filter means to establish said first flow path, said input force overcoming said resilient means causing the projection means to compress the filter means and establish said second flow path for the transmission of the first fluid through the hub means to the control valve means.

3,972,264

HYDRAULICALLY ACTUATED DETENT MECHANISM

Jesse L. Field, Jr., Braidwood, and Glen J. Medina, Joliet, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 394,189, Sept. 4, 1973, Pat. No. 3,869,107. This application Dec. 16, 1974, Ser. No. 533,181
Int. Cl.[2] F15B 13/01, 13/16
U.S. Cl. 91—358 A 4 Claims

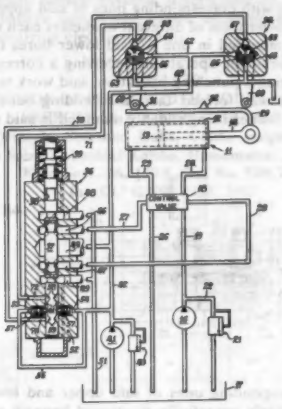
1. A fluid motor in combination with a position responsive fluid control, including a hydraulic detent mechanism, comprising:

a control valve defining a valve bore, said valve further defining a plurality of circumferentially spaced apart, opposed, radial bores communicating at their inner ends with the valve bore and at their outer ends with a common pressurized fluid conduit;

an elongated spool axially movable in said valve bore for regulating fluid communication with said fluid motor and wherein a portion of the spool defines two sets of opposed radial depressions axially spaced apart;

an imperforate detent plunger slidably arranged in each of the radial bores, the detent plungers tending to be urged into balanced detent engagement with the depressions in the spool by fluid pressure in the other ends of the radial bores;

detent kick-out means operable for selectively communicating fluid pressure into the inner ends of the radial bores and thereby tending to urge the detent plungers out of engagement with the spool; means for supplying fluid pressure to said common pressurized fluid conduit and to said detent kick-out means; and



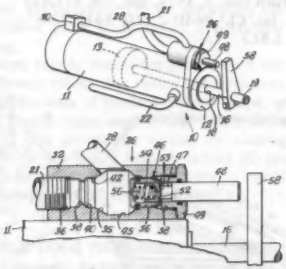
wherein the motor means comprising a hydraulic jack having a piston movable within a cylinder, the kick-out means being operatively associated with the jack and responsive to movement of the piston toward a preselected position in the cylinder.

3,972,265

STROKE CONTROL DEVICE

Ruel D. Magnuson, Lincoln, Nebr., assignor to Bruning Company, Lincoln, Nebr.

Continuation of Ser. No. 384,982, Aug. 2, 1973, abandoned. This application Dec. 9, 1974, Ser. No. 530,756
Int. Cl.[2] F15B 13/042
U.S. Cl. 91—404 1 Claim



1. Stroke control means for controlling the stroke of a hydraulic actuator having a piston movably carried in a closed cylinder provided with spaced first and second ports for providing a hydraulic fluid pressure differential across the piston for moving the piston reciprocally in the cylinder, a piston rod extending from said piston to exteriorly of said cylinder, and duct means including first, second and third ducts, said first and second ducts being connected one each to said first and second ports, said stroke control means comprising: an operator movable in correspondence with movement of said actuator piston; and a control device controlled by said operator defined by wall means defining a flow chamber having a third port defining a valve seat and adapted to be selectively connected through said first duct to a source of pressurized hy-

draulic fluid or exhaust, said wall means further defining an inwardly narrowing flow guiding surface outwardly coaxially adjacent said third port, and a fourth port spaced from said third port outwardly of said flow guiding surface, said second duct providing fluid flow connected between said fourth port and said cylinder second port, a valve stem extending through said wall means having an inner end provided with an outwardly facing shoulder and an inwardly facing shoulder spaced outwardly of said outwardly facing shoulder within said flow chamber, and an outer end disposed to be engaged by said operator, a cup-shaped valve head coaxially telescopically carried on said valve stem inner end to have preselected limited relative movement axially thereof, said valve stem being urged inwardly by movement of said operator corresponding to movement of said piston in a first direction toward one end of the stroke thereof in said cylinder caused by delivery of pressurized hydraulic fluid to said first port, said valve head having a flange engaged by said inwardly facing valve stem shoulder for causing said valve head to be moved to a preselected position spaced adjacent said third port valve seat as an incident of said piston being moved in said first direction to a preselected limit position in said cylinder, spring means disposed coaxially within said cup-shaped valve head for biasing the valve head inwardly relative to said valve stem, said second duct, during movement of the piston to said limit position, conducting hydraulic fluid from said second cylinder port to said fourth port for flow through said flow chamber past said valve head and through said third port and first duct to exhaust, said valve head being snapped into seated engagement with said valve seat to close said third port by the hydraulic fluid flowing inwardly along said flow guiding surface to said third port when said piston reaches said limit position, said valve stem being urged outwardly by said spring means when said valve head is snapped into seated engagement with said valve seat with said flange engaging said outwardly facing shoulder upon delivery of pressurized hydraulic fluid through said chamber from said third port and from said chamber through said fourth port to said cylinder second port notwithstanding inward movement of said valve stem inner shoulder away from said flange resulting from creepage of the piston beyond said limit position subsequent to the closing of said third port by the snapped movement of the valve head.

3,972,266
CONTROL CYLINDER ASSEMBLY FOR SERVO STEERING SYSTEMS

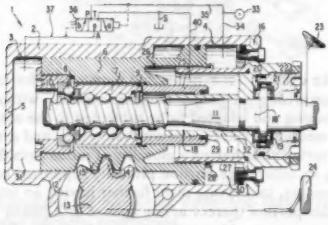
Gunther Strauff, Kaarst, Germany, assignor to Langen & Co., Duesseldorf, Germany

Filed Nov. 11, 1974, Ser. No. 522,905

Claims priority, application Germany, Nov. 10, 1973, 2356332

Int. Cl.² F15B *15/17*; F16J *1/10*; F01B *31/00*

U.S. Cl. 91—417 R **4 Claims**



1. A control cylinder assembly for use in servo steering systems operatively connected to a fluid pressure circuit including a pressure source, fluid sump means and control valve means comprising, in combination: a cylindrical housing; a servo-piston moveable axially supported in the housing and defining opposed variable-volume operational areas therein; said servo-piston including steering nut means; a steering shaft projecting into said steering nut means for displacing the steering nut means; cover means connected to the housing and closing one variable-volume operational area defined by the servo-piston, said cover means being circumposed about said steering shaft, said cover means including a first axially projecting sleeve telescoped in supporting sealed relationship with an integral portion of said servo-piston and supporting the servo-piston during its entire path of axial movement in said housing; said cover means including a second axially projecting sleeve having a diameter larger than said first axially projecting sleeve and telescoped in sealed relationship into the servo-piston and also supporting the servo-piston during its entire path of axial movement, the first and second sleeves defining therebetween an annular chamber area to which a return line of the fluid pressure circuit is constantly connected to the fluid sump means, the second sleeve and the housing defining therebetween one of the variable-volume operational areas; one operational area being constantly connected to the pressure source; another operational area being optionally connectable by the control valve means to the pressure source or to the sump means.

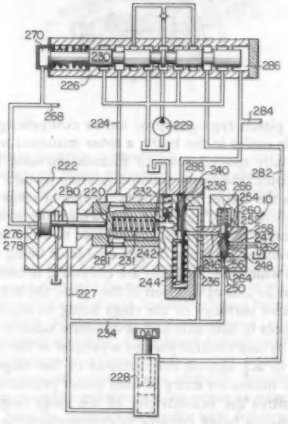
3,972,267
OVERRUNING LOAD CONTROL FOR HYDRAULIC JACKS

Willard J. Haak, Peoria; Howard A. Marsden, Pekin, and James R. Sturges, Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 5, 1975, Ser. No. 555,656

Int. Cl.² F15B *11/08*, *13/042*

U.S. Cl. 91—445 **7 Claims**



1. In a hydraulic circuit including valve means actuatable upon application of fluid pressure thereto to determine a first circuit condition, and actuatable upon release of fluid pressure therefrom to determine a second circuit condition:

means defining first variable orifice means and outlet orifice means;

motor means responsive to application of fluid pressure thereto and release of fluid pressure therefrom;

means for supplying fluid pressure to said motor means

means communicating the fluid pressure applied to the motor means through the first variable orifice means to the valve means to actuate the valve means to determine the first circuit condition;

pressure responsive means defining second variable orifice means;

means communicating the fluid pressure applied to the motor means to determine the orifice size of the second

variable orifice means, so that a relatively greater fluid pressure applied to the motor means results in a change in the orifice size of the second variable orifice means;

means for selectively reducing the orifice size of the first variable orifice means through which fluid pressure is applied to the valve means and opening said outlet orifice means; and

means for allowing release of fluid pressure from the valve means via said outlet orifice means and through the second variable orifice means upon the selective reduction of orifice size of the first variable orifice means, to determine the second circuit condition.

3,972,268

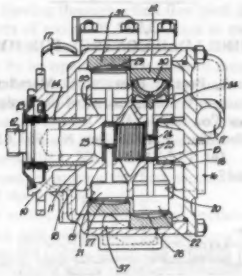
RADIAL PISTON TYPE PUMPS OR MOTORS

Frank George Freeman, Solihull, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Continuation of Ser. No. 800,153, Feb. 18, 1969, abandoned. This application Jan. 12, 1973, Ser. No. 323,235

Int. Cl.[2] F01B 13/06

U.S. Cl. 91—492 1 Claim



1. A radial piston type pump or motor comprising a body, an inlet and an outlet in the body, a rotor mounted within the body, two axially spaced rows of pistons movable in radial bores in the rotor, the bores communicating in turn with the inlet and with the outlet in the body, a pair of rings defining respective annular inner surfaces with which the rows of pistons engage respectively, to cause the same to be reciprocated as the rotor rotates, the rings being capable of being disposed in positions in which said surfaces are eccentric to one another with respect to an axis of rotation of the rotor, the eccentricity of the respective surfaces of the rings being of equal magnitude with respect to said axis and at opposite sides of the axis, a pair of side by side control pistons arranged at the same side of said rings to act against the outsides of the rings respectively, passage means for entry of fluid under pressure to these pistons to control the eccentricity of the rings respectively, said passage means being capable of communicating with the outlet, the passage means including a bore containing a spool valve for controlling the supply of fluid to the two pistons respectively and said control pistons being of different sizes, with the piston of smaller size being open to high pressure fluid at all times and the piston of larger size being open to high pressure fluid under the control of the spool valve, a valve housing having a longitudinal chamber and a pair of ports, each port communicating with a cylinder in which the control pistons are mounted, a third port supplying fluid at the outlet pressure to the chamber via the cylinder of smaller diameter and the port communicating with the chamber, and subjecting the piston in the smaller cylinder to such outlet pressure, said spool valve having axially spaced lands and being movable in the chamber which constitutes the bore of the passage means, spring means within the valve housing cooperable with the spool valve to move the valve to a position in which one of the lands closes the port providing communication between the chamber and the cylinder of larger diameter and the other land opens the port providing communication between the chamber and the cylinder of smaller diameter, a fourth port providing communication between the cylinder of smaller diameter and the chamber between the spaced lands of the valve, so that upon an increase in the outlet pressure, the valve is moved against the action of the spring means to move the land to open the port between the chamber and the cylinder of larger diameter, whereby the cylinder of larger diameter communicates with the cylinder of smaller diameter via the chamber and fourth port to cause a reduction in eccentricity of both rings to reduce the output volume, while upon a reduction in outlet pressure, the spring means moves the spool valve in the opposite direction to allow fluid in the cylinder of larger diameter to escape through the portion of the valve causing containing the spring means to the body interior at the inlet pressure whereby the piston and the cylinder of larger diameter moves to increase the eccentricity of the ring associated therewith and in turn effect a similar change in the eccentricity of the ring associated with the piston in the cylinder of smaller diameter.

3,972,269

BRAKE CYLINDER FOR VEHICLES

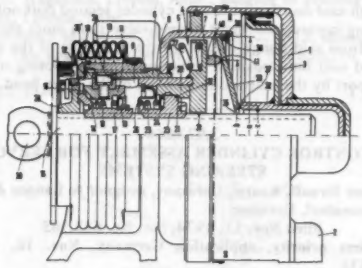
Georg Stäuble, and Bernd Wosegien, both of Munich, Germany, assignors to Knorr-Bremse GmbH, Munich, Germany

Filed Apr. 19, 1974, Ser. No. 462,417

Claims priority, application Germany, Apr. 19, 1973, 2320022

Int. Cl.[2] F16J 1/10

U.S. Cl. 92—84 8 Claims



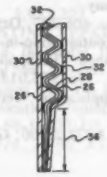
1. A brake cylinder for vehicles and particularly for railway vehicles comprising a cylinder housing, a piston within said cylinder housing and adapted to be subjected to the action of a pressure medium, a rod coaxial with said piston and actuable thereby, a spring plate having a plurality of radial slots therein and having its outer edge portion pivotally supported on said cylinder housing, said spring plate further having an intermediate annular portion thereof acting against said piston rod, a spring acting against said piston rod opposite to the direction of the pressure medium, there being a portion of said piston acting against an inner portion of said spring plate such that said spring plate constitutes a mechanical transmission linkage between said piston and said rod, said plurality of radial slots in said spring plate extend inwardly from the outer portion thereof supported upon said cylinder housing past the portions thereof acting upon said piston rod and said piston.

3,972,270

METHOD OF SEALING CORRUGATED BOARD

Elmer Marshall, Monroe, La., assignor to Olinkraft, Inc., West Monroe, La.

Division of Ser. No. 175,144, Aug. 26, 1971, Pat. No. 3,864,200. This application Jan. 27, 1975, Ser. No. 544,284
Int. Cl.² B31B 1/20
U.S. Cl. 93—58 R 7 Claims



1. A method of providing a liquid sealed box from a corrugated board construction of the type comprising a corrugated sheet having formed thereon a deformable waterproof composition in juxtaposition with a waterproof liner sheet, comprising the steps of:

a. providing a cutting and crushing die having formed on one side thereof a crusher block for completely crushing the edges of the blank;

b. cutting the corrugated board with said die and completely crushing the edges so that said crusher block compresses the edges of the blank a pre-determined amount sufficient to seal the edges from liquid whenever said blank is formed into a waterproof box; and

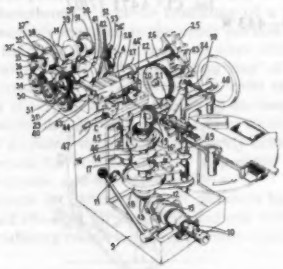
c. forming the cut and crushed board into a closed box structure.

3,972,271

APPARATUS FOR PRODUCING UNDERSTRIPS FOR HINGE LID CIGARETTE PACKETS

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Italy

Filed Nov. 8, 1974, Ser. No. 522,299
Claims priority, application Italy, Dec. 20, 1973, 3542/73
Int. Cl.² B31B 1/16
U.S. Cl. 93—58.2 R 10 Claims



1. Apparatus for producing understrip blanks for hinge lid cigarettes packets, comprising;

a track defining a straight path for a web of understrip material;

feed roll means located on the track for alternately effecting movements and rest periods of the web along the track, the feed roll means having a rotary actuator for rotating them;

scoring roll means located on the track, spaced from the feed roll means, for making in the web fed along the track two rows of indentations generally parallel to the track, with notches regularly spaced along the indentations to define lid-locking protrusions in an understrip, one protrusion corresponding to every notch, the scoring roll means having a rotary actuator for rotating them;

knife means located on the track, spaced from the feed and scoring roll means and extending transversely of the track for separating successive understrip blanks from the web by successive cuts, making one cut during each rest period of the web, the knife means having an actuator for moving it during each rest period of the web; and

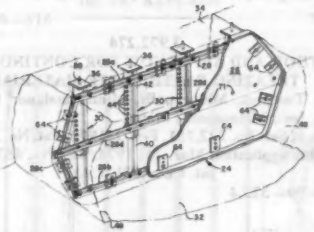
a drive system for driving the several actuators in exact synchronism with one another to place the notches and the cuts in uniform positions with respect to one another on the successive understrip blanks separated from the web.

3,972,272

MINE BRATTICE

James Allen Bagby, Greenville, Ky., assignor to Bagby Brattices, Inc., Greenville, Ky.

Filed Aug. 12, 1975, Ser. No. 604,003
Int. Cl.² E21F 1/14
U.S. Cl. 98—50 20 Claims



1. A mine brattice comprising:

a plurality of beam members to provide a continuous peripheral framework of closed polygonal configuration corresponding roughly to the transverse configuration of a mine tunnel opening to be closed against the passage of gas;

a gas impervious barrier of malleable sheet metal secured to and covering said framework, said sheet metal projecting outwardly beyond said framework and being deformed as necessary by bending to complement and engage the peripheral surfaces of the mine tunnel; and

means yieldably interconnecting said beam members to accommodate pivotal and slidable movement of each beam member relative to the other in planes parallel to said barrier, thereby to render said framework yieldable to accommodate dimensional changes in the transverse configuration of the mine tunnel.

3,972,273

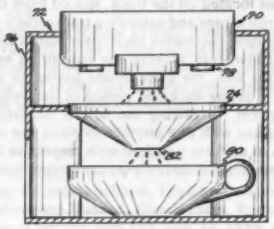
VALVE ASSEMBLY WITH WATER DISPERSING AND SPREADING SYSTEM

Richard H. Carlson, Cumberland, R.I., and Youn H. Ting, Attleboro, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 3, 1975, Ser. No. 554,384
Int. Cl.² A47J 31/00
U.S. Cl. 99—300 10 Claims

1. A valve assembly comprising: a housing having a passage extending therethrough, said passage having an inlet and an outlet with a valve seat therebetween; a valve member engageable with said valve seat; means to move said valve member into or out of engagement with said valve seat; and dispersing means at the outlet of said valve assembly comprising a dis-

persing disk positioned at said outlet passage and a plurality of channels in communication with said outlet passage which extend radially outward from said outlet passage around said dispersing disk, said dispersing disk blocking the flow of fluid



coming from said outlet passage thereby causing said fluid to flow in the plurality of channels.

9. A drip-type beverage maker as set forth in claim 8 wherein said plurality of channels are equally spaced apart in said housing to provide uniform spreading.

3,972,274

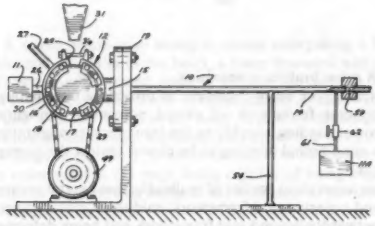
METHOD AND APPARATUS FOR CONTINUOUSLY TREATING PARTICULATE MATERIAL

Takuzo Tsuchiya, Minneapolis, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Division of Ser. No. 222,751, Feb. 2, 1972, Pat. No. 3,833,748. This application Mar. 21, 1974, Ser. No. 453,459

Int. Cl.² A23L *1/18*

U.S. Cl. 99—323.4 **4 Claims**



1. Apparatus for processing heat and pressure reactive particulate material comprising:

horizontal elongated cylinder means having a material receiving end and a material outlet end defining a restrictive orifice;

feeding means adjacent said material receiving end for feeding said reactive particulate material to the receiving end of said cylinder means;

said feeding means including means for supplying a stream of hot, pressurized gas flowing through said horizontal cylinder means, said stream being capable of carrying said reactive particulate material through said horizontal cylinder means and discharging said reactive particulate material through said orifice; and

means for supplying a second stream of gas entering the cylinder means adjacent the upstream side of said restrictive orifice, means for adjustably controlling the magnitude of said second stream, said second stream being capable of supplying a portion of the amount of gas passing through said restrictive orifice thereby limiting the amount of said first stream and reactive particulate material passing through said restrictive orifice whereby the flow rate of said first stream is reduced thereby increasing the residence time of the reactive particulate material in the cylinder means.

3,972,275

METHOD AND APPARATUS FOR ROASTING MEAT

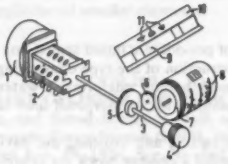
Dieter Schweig, and Sabine Schmiedel, both of Traunreut, Germany, assignors to Siemens Elektrogerate GmbH, Berlin and Munich, Germany

Division of Ser. No. 406,287, Oct. 15, 1973, Pat. No. 3,908,035, which is a continuation-in-part of Ser. No. 142,685, May 12, 1971, abandoned. This application May 6, 1975, Ser. No. 575,014

Claims priority, application Germany, May 13, 1970, 2023242

Int. Cl.² A47J *27/00*; G06C *29/00*

U.S. Cl. 99—326 **3 Claims**



1. Accessory apparatus for an oven wherein meat is precooked at an ambient temperature within the range of 230° to 270°C and then finish-cooked at a temperature within the range of 75° to 90°C, the apparatus comprising a timing member for determining the time for switching the oven from the precooking condition to the finish cooking condition, indicating means having respective weight scales disposed thereon corresponding to different kinds of meat, and selector means coupled to said indicating means and said timing member for setting the latter to correspond to the weight, type and condition of meat to be cooked.

3,972,276

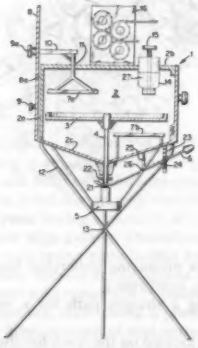
COOKING APPLIANCE

Girish Mohan Kamra, No. B-15, 8735, 165th St., Edmonton, Alberta, Canada (T5R 2R6)

Filed Apr. 26, 1973, Ser. No. 354,874

Int. Cl.² A47J *37/07*

U.S. Cl. 99—443 R **5 Claims**



1. A cooking appliance comprising an enclosed cooking chamber, a vertical shaft rotatable within said chamber, a horizontal rotatable food support means disposed within said cooking chamber and mounted on said shaft, means for rotating said shaft and said food support means, a first heating

means spaced above said food support means and a second heating means spaced below said food support means thus providing a pair of non-axial and non-overlapping heating elements geometrically disposed on opposite sides of the shaft such that food articles disposed on said food support means alternately receive heat from above and below as said food support means is rotated past said heating elements.

3,972,277

DEFROSTING APPARATUS

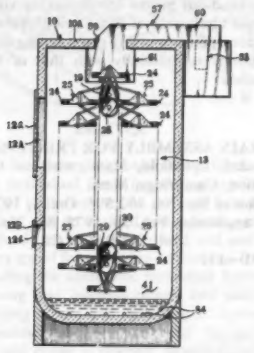
Tokuo Tamano, Kita-148, Ikomadai, Ikoma, Nara, Japan

Continuation-in-part of Ser. No. 361,080, May 17, 1973, abandoned. This application Feb. 14, 1975, Ser. No. 549,918

Claims priority, application Japan, Oct. 26, 1974, 49-123572; Jan. 22, 1975, 50-11032[U]

Int. Cl.² A47J 27/16, 27/66; A21B 01/46, 03/04

U.S. Cl. 99—451 6 Claims



1. A defrosting apparatus for frozen food comprising a casing defining a chamber, a plurality of trays for carrying various kinds of frozen food thereon, means for circulating said trays along a fixed path in said casing while each of said trays are always retained in a horizontal position, the trays being removably mounted on the circulating means, the casing being provided with an inlet opening for the trays and an outlet opening for the trays, the outlet opening being sized to be as small as possible but to permit one tray at a time to be removed therethrough, a cover consisting of a pair of half members movably mounted in the upper portion of said casing, means for closing said half members when actuated by the belowmentioned control means around one of said trays, means for irradiating micro-wave energy onto said one tray within said cover, means for selectively forming an atmosphere of heated dry air, heated humid air or steam within said casing, and a control means for successively actuating:

a. said means for circulating trays to position one of said trays between said half members,

b. said means for closing said half members to define said enclosed chamber for enclosing said one tray, and

c. said irradiating means for a predetermined period of time.

3,972,278

APPARATUS FOR TREATING FINELY DIVIDED MATERIALS WITH GASEOUS FLUID

Johan Frederik Witte, Amsterdam-Nieuwendam, Netherlands, assignor to Stork Amsterdam B.V., Amstelveen, Netherlands

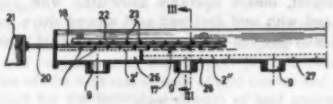
Filed Aug. 29, 1974, Ser. No. 501,824

Claims priority, application Netherlands, Aug. 31, 1973, 7312094

Int. Cl.² F26B 17/02, 17/26; A23L 1/00

U.S. Cl. 99—451 10 Claims

1. Device for treating finely divided materials with a treatment fluid, particularly for conditioning oil containing vegetable raw materials traveling in a conveyed zone from a rear part to a front part, comprising at least one vibratory conveyor with a perforated bottom and at least one inlet, opening under the perforated bottom, for introducing a treatment fluid, and



pulverizing means for pulverizing the larger particles formed by clotting during the action of the treatment fluid, said pulverizing means being disposed above said perforated bottom and being active over the total width and a substantial portion of the length of the conveyed zone of material.

3,972,279

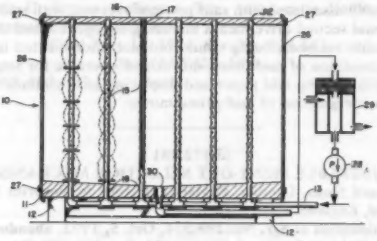
FREEZING, DEFROSTING AND STORAGE ASSEMBLY

Gilbert L. Powers, South Pasadena, Calif., assignor to W. B. Van Nest Company, Excelsior, Minn.

Filed Feb. 11, 1974, Ser. No. 441,030

Int. Cl.² A23B 4/06

U.S. Cl. 99—516 7 Claims



1. A freezing, defrosting and storage assembly for perishable meat products comprising a movable pallet, said pallet including a drain means therein with the upper surface of said pallet being sloped to said drain means, a plurality of spaced tube members of substantially equal length joined to and extending upwardly from said pallet, said tube members having a diameter such that the tube will pass longitudinally through the body cavity of an eviscerated avian, each of said tube members defining a plurality of openings along the length and spaced around the circumference thereof, means for introducing a fluid into each of said tube members under pressure so that said fluid will flow outwardly through said openings and over the internal and external surface of a fowl when mounted on said tube, a lid member adapted to be positioned in spaced relationship above said pallet by support means extending upwardly from said pallet, and fluid-tight chamber forming means extending around the periphery of and joining said lid member and said pallet.

3,972,280

APPARATUS FOR TIME SHARING OF HORIZONTAL AND VERTICAL ADVANCE

Donald S. Swatik, New Baltimore; Vahe H. Malakian, Sterling Heights, and Joseph E. Mishark, Rochester, all of Mich., assignors to Computer Peripherals, Inc., Edina, Minn.

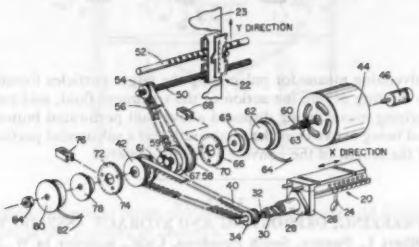
Filed Dec. 9, 1974, Ser. No. 530,636

Int. Cl.² B41J 9/04

U.S. Cl. 101—93.16 2 Claims

1. In a printer having a print station including printing mechanism and a hammer bank operably associated therewith and movable to a plurality of print positions along the line of

printing, and means for advancing paper past the print station, a prime mover caused to be driven in intermittent manner, first drive means connected with said paper advancing means, second drive means connected with said hammer bank for displacing thereof in a direction transverse of the direction of paper travel, means operably associated with said prime mover and with said first and said second drive means for causing alternate operation of said first and said second drive



means, and means connected with said operably associated means for controlling the alternate operation of said first and said second drive means in intermittent manner, said means operably associated with said prime mover and with said first and said second drive means including engageable and disengageable members being connected and disconnected in the rest condition of said prime mover and operable for sequentially advancing said paper and displacing said hammer bank upon energization of said prime mover.

3,972,281

ADJUSTABLE PRINT-OUT SELECTION MECHANISMS

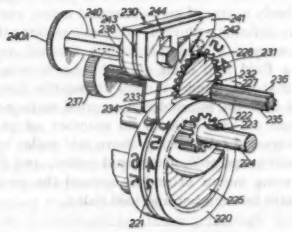
Bernard Sams, London, England, assignor to Norprint Limited, England

Continuation of Ser. No. 295,354, Oct. 5, 1972, abandoned. This application July 18, 1974, Ser. No. 489,611

Claims priority, application United Kingdom, Oct. 7, 1971, 46576/71

Int. Cl.² B41J 1/32

U.S. Cl. 101—110 **14 Claims**



1. In an adjustable-facet print mechanism

a plurality of endless print-facet carriers arranged side-by-side and movable independently of one another around a common axis to adjust the print-facets operative at any given setting, each said carrier comprising

a print wheel of annular form having

an internal annulus of teeth,

adjusting means accessible for actuation laterally of an outermost one of said print-facet carriers for adjusting at any given setting a selected one of the carriers to provide an alternative operative print-facet of that carrier, said adjusting means being arranged to engage the carriers internally and being common to all said carriers, and comprising

a splined shaft engageable selectively with the annulus of teeth of each print wheel,

selecting means for coupling the adjusting means to a selected said print-facet carrier, said selecting means accessible for actuation at a position at least substantially aligned with the actuation position of the adjusting means, and comprising

a plurality of part-circular members, one being disposed within each print wheel and

a member movable within the print wheels along a path parallel to the common axis of the wheels and so disposed that when lying within a selected wheel the part-circular member thereof shifts the selected wheel so that the internal annulus of teeth thereof meshes with the splined shaft whereby the wheel can be adjusted to a fresh operative facet by rotation of the shaft,

prismatic read-out means for displaying visually and positively the characters of those print-facets of the carriers which are operative at any given setting in an array which corresponds substantially with that of the print-facets themselves.

3,972,282

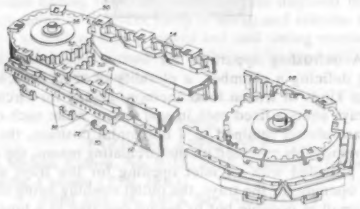
TYPE TRAIN ASSEMBLY FOR PRINTING MACHINES

Joseph Konkel, Lynnfield, Mass., assignor to Data Printer Corporation, Cambridge, Mass.

Continuation of Ser. No. 402,595, Oct. 1, 1973, abandoned. This application Feb. 20, 1975, Ser. No. 551,108

Int. Cl.² B41J 1/20

U.S. Cl. 101—111 **13 Claims**



1. A type train assembly for a printing machine, comprising, in combination:

a plurality of drive wheel means rotatably mounted on spaced-apart axes;

a pair of endless belts having opposed inner and outer edges trained around said drive wheel means and extending in spaced parallel relationship with said edges parallel about a path which includes a rectilinear portion defining a printing station;

a plurality of type carriers centered between and each attached to both of said belts, said type carriers abutting the inner edges of said belts and comprising arms extending across said belts to portions engaging said outer edges and thereby holding said belts against movement in any direction from said spaced parallel relationship; said type carriers being located along said belts in a train and abutting against adjacent type carriers in said rectilinear portion of the path of said belts, said type carriers bearing type faces on first commonly directed faces thereof, and being formed each with a guide groove of substantially U-shaped cross-section in second faces thereof directed oppositely to said first faces, said guide grooves being between said belts and aligned with said rectilinear path when said type carriers are in said rectilinear portion; and

a stationary guide bar extending between said belts along said rectilinear portion and slidably and conformably

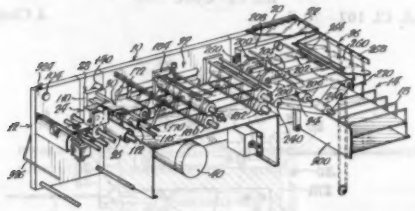
engaging said guide grooves of said type carriers passing through said rectilinear portion of the path of said belts.

3,972,283

REMOVABLE IMPRINTER WITH LATCH FOR BURSTER

Lewis F. Jennings, McHenry, Ill., assignor to Uarco Incorporated, Barrington, Ill.

Filed Sept. 16, 1974, Ser. No. 506,187
Int. Cl.² B41F *13/56, 5/04*
U.S. Cl. 101—226 3 Claims



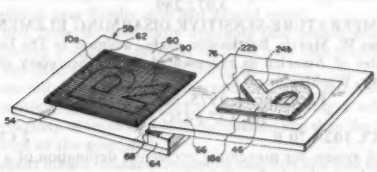
1. A burster for separating continuous forms stationery assemblies into individual form lengths, comprising: means defining a path of stationery travel through said burster and including an infeed and an outfeed end; bursting means intermediate said infeed end and said outfeed end and along said path of stationery travel for receiving continuous forms assemblies and separating the same into individual form lengths; a housing containing said bursting means and said stationery travel path defining means and including an openable cover including a member slidably mounted on said housing whereby when said cover is opened, access to said bursting means and said stationery travel path defining means may be had; a removable imprinter assembly received within said housing along said stationery path between said infeed end and said bursting means for imprinting selected information on continuous business forms prior to their being received by said bursting means; latch means for latching said printing means within said housing; and manually operable handles secured to said latch means and movable to a position within the path of movement of said member when said latch means are in an unlatched condition and to be engaged by said member when said member is moved to a closed position to move said latch means into latching engagement with said housing.

3,972,284

NEEDLE POINT PRINTING APPARATUS

Dale J. Bell, 3016 Central St., Evanston, Ill. 60201

Filed Mar. 5, 1974, Ser. No. 448,382
Int. Cl.² B41F *31/00*
U.S. Cl. 101—327 16 Claims



1. A printer for use in printing a multi-colored coded design on the outer surfaces of one side of the spaced interwoven bi-axial strands of a piece of presteamed and softened needle point canvas comprising:

a support and orienting plate;

spaced upright projections on one side of said support and orienting plate corresponding to the spaces between the strands of said canvas whereby placement of said canvas thereon in softened condition bi-axially orients said strands;

a support grid having a lattice of ribs corresponding to the bi-axial strands of said canvas and adapted to be placed on said projections of said support plate to orient said lattice of ribs with said strands of said canvas and provide support for the individual strands of said canvas along their two axes when placed thereon and removed from said orienting plate;

a printing plate;

printing means adapted to be affixed to said printing plate;

said printing means having a resilient porous paint carrier surface for one of said colors and shaped in reverse of the desired outline of said design;

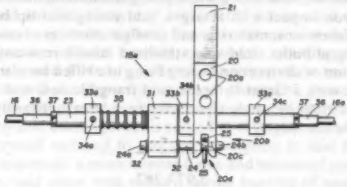
means to apply paint of one of said colors to said paint carrier surface and means to orient said printing plate upon said canvas whereby said paint carrier surface is brought into contact on said side with the outer portions of the strands of said canvas piece at a predetermined location thereon while supported on said support grid.

3,972,285

OBJECT ARRAY PLACEMENT DEVICE

Claude H. Brown, Arlington, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Nov. 11, 1974, Ser. No. 522,542
Int. Cl.² F42B *3/00*
U.S. Cl. 102—22 14 Claims



1. A primary release appliance, comprising:

a. drive shaft means for receiving a linear force and for moving linearly from a first position to a second position in response to said force;

b. bias means, operably connected to said drive shaft means, for biasing said drive shaft means toward said first position;

c. mounting block means for slidably supporting said drive shaft, said mounting block means having a downwardly opening slot;

d. slide pin means, transversely intersecting said slot, for releasably maintaining a portion of an object within said slot;

e. sliding block means, slidably mounted on said drive shaft means and operably connected to said slide pin means, for moving said slide pin means out of intersection with said slot when said sliding block means is moved from a closed position to an open position;

f. abutment means, attached to said drive shaft means, for moving said sliding block means from said closed position to said open position when said drive shaft means moves from said first position to said second position; and

g. yieldable means, between said sliding block means and said drive shaft means for yieldably biasing said sliding block toward said closed position.

3,972,286

BULLET

Jack Y. Canon, 2194 Delmas, Opelousas, La. 70570

Division of Ser. No. 405,781, Oct. 12, 1973, Pat. No. 3,911,820, which is a continuation-in-part of Ser. No. 237,271, March 23, 1972, abandoned. This application Nov. 5, 1974, Ser. No. 521,084

The portion of the term of this patent subsequent to Oct. 14, 1992, has been disclaimed.

Int. Cl.² F42B 5/02

U.S. Cl. 102—38 15 Claims

1. A spin stabilized bullet for rifled bore small arms comprising a hollow open-ended missile casing formed for releasable coupling with a cartridge carrying a propellant charge, said casing being of substantially cylindrical form over at least the major portion of its length such that said major cylindrical portion defines substantially the full caliber of the bullet, said casing having a closed base end, said casing enclosing a multiplicity of heavy discrete shot particles freely separable from each other at least upon impact with a target after firing, and a separate tip extending into and frangibly sealed to and closing the open end of said hollow casing, said tip being of impact frangible material which will disintegrate into numerous particles upon impact with a target, said casing and tip being of such dimensions, materials and configurations as to constitute an integral bullet sized spin stabilized missile resistant to deformation or destruction during firing in a rifled bore and until impact with a target to break said frangible seal and release said multiplicity of shot particles to scatter outwardly separately in the target.

3,972,287

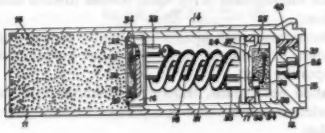
CARTRIDGE

Bruce W. Travor, Holland, Pa., and Lennord L. Pitney, Park Rapids, Minn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 15, 1974, Ser. No. 524,289

Int. Cl.² F42B 3/04

U.S. Cl. 102—39 3 Claims



1. In a gas generating device comprising, a cartridge case having a gas generating charge therein,

a retainer secured in said case and having a rearward base portion containing a primer and a substantially cylindrical sidewall portion containing a delay ignition element,

said delay ignition element including a spool having a pair of end flanges each containing a recess, ignition mix in one of said recesses and ignited by said primer, igniter mix in the other of said recesses for igniting said gas generating charge, and a burnable fuze delay wire spirally wound on said spool and having its end portions embedded in corresponding ones of said ignition mix and igniter mix, and

an O-ring seal on an end flange of said spool forwardly adjacent said ignition mix.

3,972,288

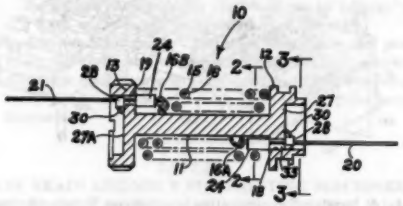
PYROFUZE ARRANGEMENT

Bruce W. Travor, Holland, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 29, 1974, Ser. No. 518,426

Int. Cl.² C06C 5/00

U.S. Cl. 102—70 R 4 Claims



1. In a spool wrapped with a covered fuze delay wire, said spool having a pair of longitudinally spaced end flange portions and an intermediate hub portion, each of said flange portions having a longitudinal passage, said fuze wire having portions of uncovered ends extending through a corresponding one of said passages,

a heat shrunk tubing member secured to a corresponding uncovered portion of each wire intermediate the covered wire portion and the respective uncovered wire end portions, said tubing member containing a corresponding silicone rubber strip securing the respective uncovered wire portions within said tubing member, each of said tubing members being in abutment with a corresponding inner surface of one of said spool end flanges,

a heat shrunk tubular member secured to corresponding ones of said uncovered end portions of said wire and containing a corresponding silicone rubber element, securing the respective uncovered end portions within the corresponding tubular member, each of said tubular members being in abutment with a corresponding outer surface portion of one of said spool end flanges, and

means surrounding each of said heat shrunk tubular members and sealing said corresponding passages externally of said corresponding tubular members.

3,972,289

TEMPERATURE-SENSITIVE DISARMING ELEMENT

Charles W. Morris, Bartlesville, Okla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 4, 1975, Ser. No. 565,041

Int. Cl.² F42C 19/02

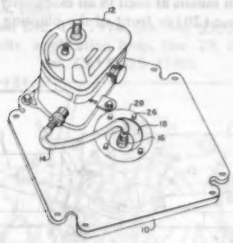
U.S. Cl. 102—70 R 2 Claims

1. A system for preventing accidental detonation of a warhead charge due to fire comprising:

means for containing the booster charge of said warhead;

a retaining ring placed over at least part of said containing means so as to hold the latter in place, at least that part of said retaining ring which covers said containing means being fabricated from a material whose mechanical strength degrades rapidly in a hot environment;

whereby if a fire occurs in the vicinity of said warhead said retaining ring would degrade, enabling said containing



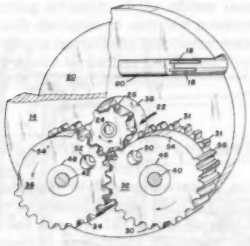
means to break away from said booster charge, thereby preventing detonation of said warhead.

3,972,290

FLYWHEEL TYPE ODOMETER SAFING AND ARMING MECHANISM

Norman Czajkowski, Chevy Chase; William J. Donahue, Takoma Park; James M. Douglas, Silver Spring, and Thomas A. Cammack, Beltsville, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 28, 1975, Ser. No. 599,806
Int. Cl.[2] F42C *15/22*
U.S. Cl. 102—79 10 Claims



1. A safety-and-arming mechanism adapted for use in a projectile comprising:

an explosive firing train;

a rotor having means for completing said firing train;

a pinion gear fixedly attached to said rotor;

a first drive intermittently engaging said pinion gear and having a selected plurality of teeth with face dimensions less than the thickness of the gear;

a second drive gear engaging said first gear and intermittently engaging said pinion gear and having a selected plurality of teeth with face dimensions less than the thickness of the gear; and

support means rotatably mounting said first and said second drive gears for meshing engagement with each other and with said pinion gear,

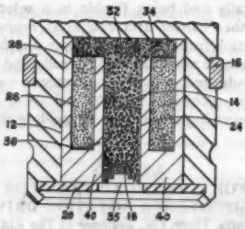
whereby rotation of said drive gears displaces said rotor from an out-of-line, safe position to an armed position, with said means for completing said firing train in line with the other components of said firing train.

3,972,291

EXTENDED RANGE TRACER FOLDED CUP

Frank E. Braun, Jr., Chalfont, Pa., and Wilmer White, Haddonfield, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 22, 1974, Ser. No. 526,193
Int. Cl.[2] F42B *11/16*
U.S. Cl. 102—87 6 Claims



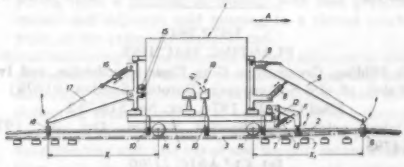
1. In a tracer projectile having a tracer cavity extending into the rear end of the projectile, a metal folded cup mating within said cavity and secured therein by a disc, said folded cup comprising a rearward wall, an inner wall and an outer wall concentric with said inner wall, said rearward wall of said folded cup being adjacent the rear end of the projectile, said inner wall and said outer concentric wall extending forwardly axially from said rearward wall and defining an annular cavity between said inner and said outer wall, said inner wall being slightly shorter in length than said outer wall, said inner wall defining a central cavity which extends through said rearward wall, said annular cavity inclosing a greater volume than said central cavity, said folded cup having a forward end integral with said annular cavity and said central cavity, said annular cavity and said central cavity being coextensive with a rearward portion of said forward end and in abutting relation therewith; said folded cup containing pyrotechnic tracer formulation and causing a burning front thereof to proceed forwardly in said central cavity from adjacent said rearward wall whereby said burning front is caused to reverse its direction at said forward end and to proceed rearwardly in said annular cavity to provide a more intense flame and increased pressures therein, said inner wall melting during burning of said pyrotechnic tracer formulation in said annular cavity.

3,972,292

TRACK RENEWAL APPARATUS

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H., Vienna, Austria

Filed Mar. 5, 1975, Ser. No. 555,703
Claims priority, application Austria, Mar. 11, 1974, 2020/74
Int. Cl.[2] E01B *29/17*
U.S. Cl. 104—2 2 Claims



1. In a mobile track renewal apparatus for concurrently receiving an old rail of an existing track and laying a new rail of a replacement track, which comprises a frame mounted for mobility on the replacement track in an operating direction

during track renewal, a carrier arm extending forwardly in the operating direction from the mobile frame, the carrier arm being adjustable vertically and laterally and being fixable in a selected adjusted position, means laterally of the frame and carrier arm for receiving the old rail, the rail receiving means being mounted on the frame for movement along the rails, and means mounted on the frame for guiding and laying the new rail, the rail guiding and laying means being adjustable vertically and laterally and being fixable in a selected adjusted position: a further carrier arm extending rearwardly in the operating direction from the mobile frame, the further carrier arm being adjustable vertically and laterally and being fixable in a selected adjusted position, and means on the further carrier arm for receiving the old rail from the laterally mounted rail receiving means and for guiding the old rail.

3,972,293

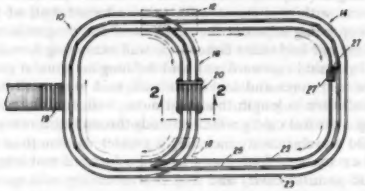
SWITCH FOR A RAILROAD TRANSPORTATION SYSTEM EMPLOYING A ROTATING DRIVE SHAFT

Max Weiton Watts, Tiger, Ga., assignor to The Aid Corporation, Clayton, Ga.

Division of Ser. No. 454,446, March 25, 1974, Pat. No. 3,897,734. This application Mar. 17, 1975, Ser. No. 558,658

Int. Cl.² E01B 7/00

U.S. Cl. 104—130 **6 Claims**



1. A switch for a railroad transportation system comprising parallel car supporting rails defining railroad tracks which bifurcate at a switching station into two branch tracks and switch being in combination with a car having four car supporting wheels mounted beneath said car for rotating about parallel axes extending substantially normal to the plane of said railroad tracks and a camming surface rigidly mounted beneath said car comprising a first section adjacent the front of said car extending obliquely with respect to said car wheel axes and a second section merging with said first section extending substantially parallel said car wheel axes; rotatable drive shafts extending along a line between said parallel car supporting rails and which bifurcates at said switching station into first and second branch lines; a first car supportable swing gate rail mounted at said switching station for movement between a position traversing said first branch line and a position aside said first branch line; and a second car supportable swing gate rail mounted at said switching station for movement between a position traversing said second branch line and a position aside said second branch line.

3,972,294

PLANTING MACHINE

Erik Hilding, Grundström; Göte Einar Grundström, and Ivar Waleij, all of 8 Sockenvagen, Dorotea, Sweden (91070)

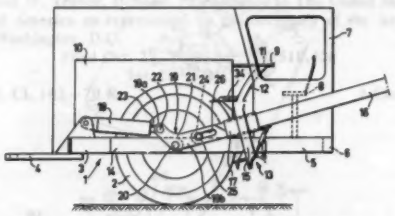
Filed Oct. 21, 1974, Ser. No. 516,762

Claims priority, application Sweden, Oct. 31, 1973, 7314795

Int. Cl.² A01C 11/00

U.S. Cl. 111—3 **20 Claims**

1. A planting machine having at least one liftable and lowerable planting member for dropping a plant, held therein, into a hole in the ground by the planting member, said planting member in its position lowered into the soil standing still in relation to the soil during the normal advancing movement of the machine, characterized in that the planting member (15) is slidably mounted on and movable along an essentially straight arm means (16) extending in the longitudinal direction of the machine, said arm means being pivotally mounted on said machine for movement in a vertical plane; means for moving said arm means at least in an essentially vertical plane around said pivot (20) in front of the planting member from



a position substantially in parallel with the soil, in which position the planting member is kept lowered into the soil and standing still in relation to the soil through the act of the relative mobility between the planting member and the arm means, to a position inclined obliquely forward to the soil for lifting and repositioning the planting member to its starting position on the arm means (16).

3,972,295

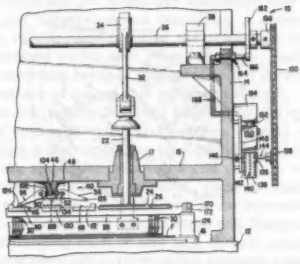
NEEDLE BAR PATTERN SHIFTING DEVICE

Randel P. Smith, Chattanooga, Tenn., assignor to The Singer Company, New York, N.Y.

Filed Oct. 8, 1975, Ser. No. 620,518

Int. Cl.² D05C 15/30

U.S. Cl. 112—79 A **7 Claims**



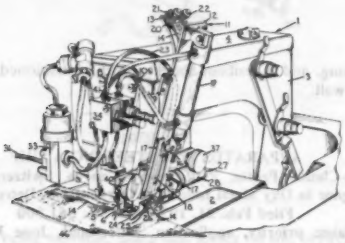
1. A patterning device for a tufting machine having a reciprocating needle bar carrying a plurality of needles disposed laterally across the machine and adapted to penetrate a backing moving longitudinally of the machine to insert a plurality of stitches upon each penetration of the backing, and means for mounting said needle bar for lateral movement relative to said backing, said pattering device comprising: a pair of normally inactive oppositely directed lateral force transmitting members mounted on the tufting machine above said needle bar, a pair of lateral force receiving members mounted on said needle bar and individually disposed to cooperate with a respective one of said force transmitting members as the needle bar moves upwardly and approaches the top dead center position, and pattern control means for activating one of said force transmitting members selectively into coupling engagement with the cooperating force receiveing member to shift said needle bar laterally.

3,972,296

DEVICE FOR CUTTING AND INSERTING A CONTINUOUSLY FED RIBBON UNDERNEATH THE PRESSURE FOOT OF A SEWING MACHINE

Nerino Marforio, Milan, Italy, assignor to Rockwell-Rimoldi S.p.A., Milan, Italy

Filed Dec. 17, 1974, Ser. No. 533,500
Claims priority, application Italy, Dec. 27, 1973, 32288/73
Int. Cl.² D05B *35/06*
U.S. Cl. 112—121.27 1 Claim



1. A device for cutting and inserting a ribbon beneath the presser foot of a sewing machine and onto a workpiece to which it is to be sewn, said device comprising:

a. a guide fixed on the sewing machine for guiding the ribbon as it is drawn from its source;

b. a ribbon charging device comprising an upwardly extending elongated passage fixed on the presser foot and movable with the latter between a first position of mating relation with the guide for receiving the ribbon therefrom and a second position in close proximity with the workpiece for inserting the ribbon between the latter and the presser foot;

c. ribbon feed means for advancing the ribbon in said guide for effecting advance of the ribbon into said charging device with the latter in said first position; and

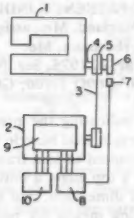
d. cutting means operatively associated with said guide and charging device for cutting the ribbon when said charging device is in said second position.

3,972,297

SEWING MACHINE POSITION AND SPEED SENSING SYSTEM

Juergen Melcharick, Bissingen, Germany, assignor to Union Special Corporation, Chicago, Ill.

Filed Jan. 27, 1975, Ser. No. 544,443
Claims priority, application Germany, Jan. 30, 1974, 2404346
Int. Cl.² D05B *69/22*
U.S. Cl. 112—219 A 2 Claims



1. A device for sensing the speed and angular position of a sewing machine main shaft comprising:

multiple impulse transmitter means mounted on said shaft for rotation therewith and including a series of circumferentially spaced poles, transmitting a series of impulses during one revolution thereof and at least one non-polarized area means producing more than one successively identical impulse relative to a predetermined angular position of said shaft;

Hall generator means associating with said multiple impulse transmitter means for determining polarities of said impulses;

impulse preparation means for receiving impulses from said Hall generator means;

logic circuitry means connected with said impulse preparation means for receiving impulses therefrom and for generating a signal at the angular position of said shaft when more than one successively identical impulse is produced whereby sensing the position of said shaft;

gate means connected to and receiving output from said impulse preparation means;

frequency voltage converter means receiving output from said gate means and producing a voltage which is proportional to the number of impulses produced per unit of time; and

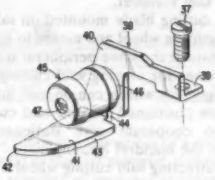
comparator means receiving current from said frequency voltage converter means comparing said voltage with a preset voltage whereby sensing the speed of said shaft.

3,972,298

PRETENSION THREADING DEVICE

Gustave Berman, Rockaway, and Robert Barrett Brauch, Wayne, both of N.J., assignors to The Singer Company Patent Department, New York, N.Y.

Filed June 10, 1975, Ser. No. 585,557
Int. Cl.² D05B *47/00*
U.S. Cl. 112—254 4 Claims



1. A device facilitating threading of a pretension means of a sewing machine having a housing and a thread supply means supported for supplying thread to said pretension means, said device comprising:

Support means disposed on said housing for supporting said pretension means externally of said housing and forming with said pretension means a thread tensioning means at said pretension means and said support means interface, said support means including an ear on one side of said pretension means extending in a direction away from the supply of thread from said thread supply means and tapering from a position in overlap with said pretension means and adjacent said housing to a thread catching point at the extremity thereof; and,

thread deflecting means disposed closely adjacent to and in spaced relationship to said pretension means said thread deflecting means terminating at said interface, said thread deflecting means tapering to said housing in a direction away from said thread supply means and being positioned for deflecting with said ear of said support means a thread from said thread supply means onto said pretension means;

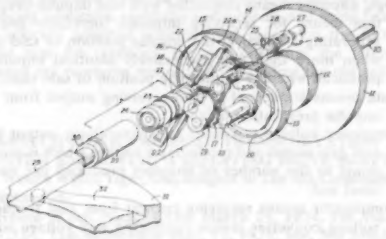
whereby thread from said thread supply means placed in said thread catching point will be deflected towards said housing by said ear of said support means while simultaneously being deflected about said pretension means to said interface by said thread deflecting means.

3,972,299

CAN BODY TRIMMER

Richard J. Hasselbeck, Houston, and Kurt H. Wills, Sidney, both of Ohio, assignors to The Stolle Corporation, Sidney, Ohio

Filed Jan. 31, 1975, Ser. No. 546,135
Int. Cl.² B21D 51/38, 51/10; B26D 1/56
U.S. Cl. 113—7 R 8 Claims



1. A trimming machine for trimming drawn and wall-ironed cans to length, comprising

a. a trimming mandrel mounted in a housing, and means to rotate said mandrel,

b. feeding means for successively bringing cans to be trimmed into position in axial alignment with said mandrel,

c. a loading plunger for pushing an aligned can onto said mandrel,

d. means on said mandrel for gripping a can to cause it to rotate with said mandrel,

e. an internal cutting blade mounted on said mandrel,

f. an exterior cutting wheel and means to cause said cutting wheel to rotate at the same peripheral speed as said mandrel, and means for moving said cutting wheel into and out of engagement with a can on said mandrel,

g. scrap cutters positioned beyond said cutting wheel and arranged to cooperate with stationary parting dies mounted on the mandrel housing,

h. means for retracting said cutting wheel from contact with the can,

i. means to cause said loading plunger to push said can to the point where the scrap overlies said parting dies,

j. means to actuate said scrap cutters to cut said scrap,

k. means to remove said cut scrap,

l. means to eject said trimmed can from scrap cutting position,

m. means to retract said loading plunger, and

n. means to cause said trimmed can to follow said retracting loading plunger to remove it from said mandrel,

all of said means operating in timed relation from a common drive.

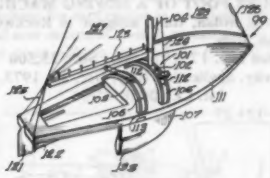
3,972,300

SAILING CRAFT

Leo J. Adamski, Apt. 1-H, Yip Mansion, Pine Court, 5 Old Peak Road, Hong Kong, Hong Kong

Filed May 28, 1974, Ser. No. 473,581
Int. Cl.² B63B 39/00; B63H 9/00
U.S. Cl. 114—39 14 Claims

1. A sailing craft including a one-piece hull design, a unitary mast-keel-ballast assembly rotatably mounted on said hull and including a mast, a depending keel and a ballast positioned on the lower edge of said keel, said mast-keel-ballast assembly having a pivotal axis adjacent the upper surface of the hull, a pair of spaced stops positioned in said hull and cooperating with said mast-keel-ballast assembly to limit the arc of rotation thereof, said hull having an elongated opening extending downward therethrough, said opening having downwardly and outwardly inclined side walls forming said spaced stops, said keel of the assembly extending downwardly through said



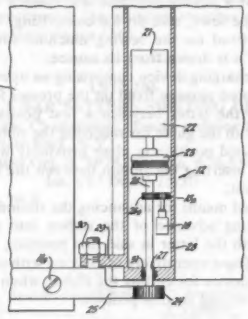
opening, and a resilient shock absorber positioned on each side wall.

3,972,301

APPARATUS FOR STEERING A SHIP

Jean-Claude Protta, Petit-Lancy, Geneva, Switzerland, assignor to Oxy Metal Industries Corporation, Detroit, Mich.

Filed Feb. 21, 1975, Ser. No. 551,800
Claims priority, application Switzerland, June 12, 1974, 8017/74
Int. Cl.² B63H 25/06
U.S. Cl. 114—162 4 Claims



1. An apparatus for steering a ship comprising,

a. a trim tab adapted to be rotatably secured to a rudder for movement relative thereto,

b. drive means secured to and sealed within said trim tab in a water-tight manner, wherein said drive means is responsive to an electrical signal for rotating said trim tab relative to said rudder, and

c. generator means on said ship for transmitting said electrical signal to the drive means.

3,972,302

VELOCIPEDE PRESENCE INDICATING DEVICE

Alan E. Sherman, Overland, Mo., assignor to Steven Manufacturing Company, Hermann, Mo.

Filed Apr. 4, 1975, Ser. No. 565,064
Int. Cl.² B60Q 11/00; G09F 17/00
U.S. Cl. 116—28 R 7 Claims

1. A device for indicating the presence and distance required to clear a bicycle, said bicycle having a frame member and a handlebar mounted to said frame, comprising:

a bracket having a top edge, a bottom edge, a pair of side edges, a length dimension, and a width dimension, said bracket including means for mounting said bracket to said bicycle, said bracket including a flange extending outwardly from the top edge of said bracket, said bicycle further being characterized by a rear wheel, and a luggage rack, said luggage rack being mounted over the rear wheel of said bicycle, said bracket being mounted to said

luggage rack so that said flange abuts the luggage rack, preventing rotation of said bracket;

spring means attached to said bracket, said spring means extending outwardly from said bracket;

a pair of flag and reflector rods having first and second ends, one each of said rods being mounted to said spring means along the first end of each of said rods so that said flag and reflector rods extend outwardly on oppositely opposed sides of said bicycle, said pair of flag and reflector

rods being movable, along said spring means, between at least a first, extended position and a second, stored position; and

means for attaching the second end of said flag rod to said bicycle, engagement of said flag rod and said attaching means defining the second, stored position for said flag rods, said attaching means including a clip means slidably mounted to said luggage rack, and means for receiving the free end of said flag rod.

3,972,303

APPARATUS FOR APPLYING AN ADHESIVE TO AN INSOLE

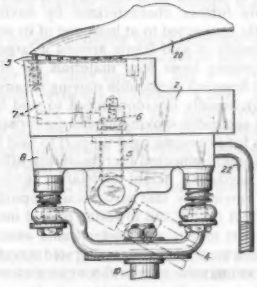
Herbert Klantke, Lemberg, Pflaz, and Herbert Schindler, Wagenstr. 38, 678 Pirmasens, both of Germany

Continuation of Ser. No. 768,755, Oct. 18, 1968, abandoned, which is a continuation-in-part of Ser. No. 627,028, March 30, 1967, abandoned. This application Feb. 22, 1973, Ser. No. 334,885

Claims priority, application Germany, Apr. 1, 1966, 69007; May 13, 1966, 38986

Int. Cl.² B05C *5/02*

U.S. Cl. 118—3 **14 Claims**



1. Apparatus comprising a carrier for an upper and an insole, a body, means for relatively displacing said body and carrier to urge said body towards the carrier, adhesive distribution means extending from said body and adapted for being applied against the insole, control means for applying a yieldable force against said distribution means to maintain the latter in extended condition, said distribution means being depressible against said force for conforming to the shape of said insole, and adhesive supply means coupled to and supplying adhesive to said distribution means via said body, said distribution means including a plurality of individual plungers arranged along a path conforming to the shape of the pattern of application of the adhesive to the insole, said control means including individual springs respectively acting on said plungers to urge the same outwardly from said body, said body being directly provided with a plurality of adjacent individual smooth bores each respectively slidably accommodating one said plunger, said plungers and bores being of corresponding dimensions such that the plungers are supported without substantial play in the bores, and longitudinal feed means in each plunger for conveying adhesive to the insole and for depositing the adhesive on the insole while the plunger is in contact with the insole whereby each individual plunger independently controls the flow of adhesive to the isole at its respective deposit location and serves as the exclusive means by which adhesive can reach said insole, said body being provided with a central hollow tub including an edge portion bordering the tub and having an inclined face sloping downwardly and inwardly towards the tub, said plungers being disposed in and distributed around said edge portion and individually projecting beyond said inclined face.

3,972,304

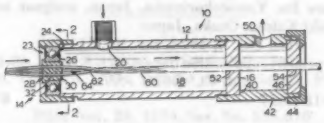
DEVICE FOR FILLING MULTI-STRANDED ELECTRIC CABLE

Jean Raymond Boucher, Chateauguay Centre, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed Apr. 22, 1975, Ser. No. 570,396

Int. Cl.² B05C *8/04*

U.S. Cl. 118—44 **4 Claims**



1. A device for filling the interstices of a multistranded core of a cable with solid or viscous material, comprising a cylindrical die having a plurality of passages opening from each end thereof, the passages being arranged in a cylindrical locus about an axis, the die being journalled in mounting means and being freely rotatable about said axis, each of said passages being of a diameter to pass at least one strand of said core whereby the strands are spread apart on passing through the die, one end portion of the die projecting axially from the mounting means, said one end portion carrying passage means opening from the side thereof to define scoop means and opening axially from the free end thereof.

3,972,305

IMAGING SYSTEM

Masamichi Sato, Tucson, Ariz., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 346,215, March 29, 1973, which is a continuation of Ser. No. 807,353, March 14, 1969, abandoned. This application Mar. 21, 1975, Ser. No. 560,743

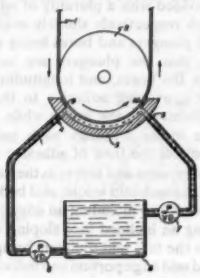
Claims priority, application Japan, Apr. 11, 1969, 44-24283

Int. Cl.³ G03G *15/10*

U.S. Cl. 118—637 **6 Claims**

1. An apparatus for forming images comprising means to support an electrostatographic imaging member having a recording surface, a development electrode having a leading edge extending transversely across at least the width of said recording surface and a trailing edge extending across at least the width of said recording surface wherein said development electrode is spaced from and parallel to at least a portion of said recording surface, means to transport said recording

surface at a velocity of at least about 40 centimeters per second past said development electrode, pumping means to flow a liquid developer between said recording surface and said development electrode at a velocity substantially equal to the velocity of said recording surface so that little or no relative movement exists between said liquid developer and said



recording surface to thereby avoid depletion of developer marking particle deposit on said recording surface, and a raised lip along said leading edge and a raised lip along said trailing edge of said development electrode to direct the flow of said liquid developer between said recording surface and said development electrode and to seal said liquid developer from exposure to the ambient atmosphere.

3,972,306

COIL SHAPED DEVELOPING ELECTRODE FOR A COPYING MACHINE

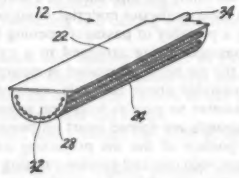
Fukusaburo Ito, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 4, 1974, Ser. No. 512,292

Claims priority, application Japan, Oct. 5, 1973, 48-112501

Int. Cl.² G03G *15/10*

U.S. Cl. 118—637 **5 Claims**



1. In a developing unit for an electrostatic copying machine which forms a developed image on a photosensitive paper by virtue of the sequential operations of charging, exposure and developing, the improvement which comprises:

a coil shaped resilient developing electrode provided in close proximity to the path of the traveling photosensitive paper within the developing unit.

3,972,307

MOVABLE FENCE TO CONTROL CATTLE PASTURAGE

Jorge Marseillan, Sarmunto 440, Buenos Aires, Argentina

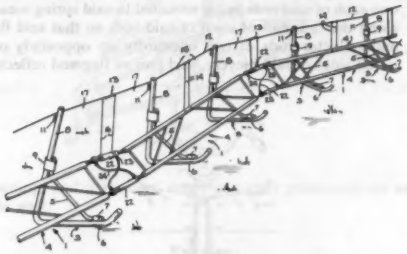
Filed Oct. 18, 1974, Ser. No. 516,081

Claims priority, application Argentina, Oct. 25, 1973, 250712

Int. Cl.² A01K *3/00*

U.S. Cl. 119—20 **9 Claims**

1. A movable fence for the control of cattle pasturage comprising; a plurality of fence sections each having transverse displacement means contacting the surface of the ground, connection means for connecting adjacent ends of said sections, each section having at least one opening adequate for the passage of the head of an animal therethrough and pushing



means against which an animal may exert a pushing force, and displacement and hooking means at the end sections of the fence for connection with guiding means to guide fence movements.

3,972,308

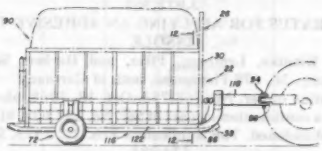
APPARATUS FOR MOVING AND SELF-FEEDING OF LARGE HAYSTACKS

Daniel F. Ray, c/o Davis, McCaleb & Lucas, 230 W. Monroe St., Suite 2040, Chicago, Ill. 60606

Filed Oct. 3, 1974, Ser. No. 511,575

Int. Cl.² A01K *5/00*

U.S. Cl. 119—60 **1 Claim**



1. Apparatus for effecting moving and self-feeding of large compacted haystacks, comprising in combination: a rigid, rectangular-shaped feeder frame assembly, at least one side thereof having a plurality of vertical bars spaced to receive the head and neck of feeding animals between adjacent bars, said frame assembly further characterized by having one side thereof hingedly connected to at least one of its adjacent sides to allow placement of said frame around a large compacted haystack comprising loose feed materials for effecting self-feeding of said haystack; separable moving means operable to be slidingly, frictionally interconnected to said feeder frame assembly, said separable moving means comprising structural support means for providing rigid support to said feeder frame assembly once interconnected thereto during lifting and moving of said haystack; height-adjustable, ground-engaging wheel means carried by said structural support means and operable to effect raising and lowering of said interconnected structural support means and feeder frame assembly; implement connection means for connecting said structural support means to a drawing vehicle; plural tongue means rigidly connected to said structural support means and operable to slide under said feeder frame assembly when said height-adjustable, ground-engaging wheel means are in retracted condition, whereby said feeder frame assembly frictionally interconnects to said structural support means of said separable moving means through said plural tongue means, said plural tongue means further characterized by being operable to undersupport said haystack when thrust thereunder, said tongue means being spaced sufficiently close enough to prevent substantial loss of said loose feed material therebetween during said

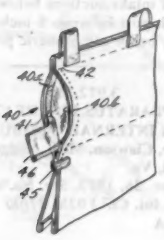
undersupporting; whereby the moving and self-feeding apparatus is operable to liftingly support and movably transport said haystack within said frame assembly after said separable moving means and interconnected feeder frame assembly have been respectively forcibly thrust under and placed around said haystack, and said height-adjustable, ground-engaging wheel means have been extended sufficiently to effect lifting of said interconnected structural support means and feeder frame assembly and said undersupported haystack, the separable moving means further characterized as being detachable from said feeder frame assembly for use with other feeder frame assemblies.

3,972,309

END OPENING DUSTING BAG

William C. Cortner, Jr., St. Joseph, Mo., assignor to Dale Alley Co., St. Joseph, Mo.

Filed Jan. 30, 1975, Ser. No. 545,752
Int. Cl.² A01K *29/00*
U.S. Cl. 119—159 **31 Claims**



13. A protected self-dusting livestock dust applicator comprising:

at least one inner porous storing and dusting bag having at least a bottom for dispensing dust and having a vertical dust filling opening extending from adjacent the top of said bag toward said bottom,

outer means of flexible weatherproof material substantially overly covering said inner bag and secured therewith and providing skirt means extending substantially below the said bottom portion of said inner bag to allow substantial fold of said skirt means under said bag to provide protection to said inner bag from use by livestock including mishandling thereby and from foreign matter and moisture,

said outer means including outer covering material having a vertical filling opening adjacent to and coinciding with said inner bag filling opening, and

weatherproof vertically disposed Velcra closure means secured to said inner bag and outer covering material adjacent said openings for fully and automatically closing said inner bag through said filling openings after a given amount of dust is disposed therein for preventing substantial penetration of moisture to said inner bag when closed.

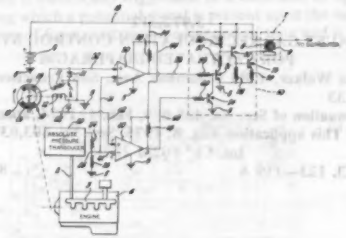
3,972,310

ELECTRONIC INTERNAL COMBUSTION ENGINE IGNITION SPARK VACUUM AND SPEED ADVANCE SYSTEM

Charles C. Gambill, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 16, 1974, Ser. No. 497,901
Int. Cl.² F02P *5/04*
U.S. Cl. 123—117 R **4 Claims**

1. An electronic internal combustion engine ignition spark vacuum and speed advance system comprising in combination with an internal combustion engine and an ignition coil having a primary winding: means for producing in timed relationship with said engine two series of phase displaced leading and trailing electrical signal wave forms of a substantially equal potential level proportional to engine speed; means for producing an engine manifold absolute pressure electrical signal of a potential level proportional to engine manifold absolute pressure; means responsive to said leading electrical signal wave forms and said engine manifold absolute pressure signal for producing an ignition dwell signal while the potential level of each of said leading electrical signal wave forms is greater



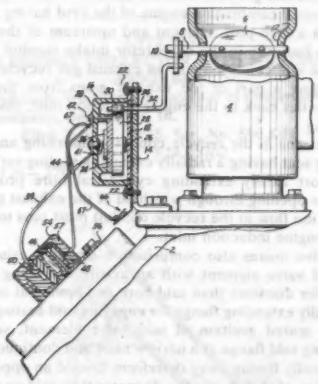
than that of said engine manifold absolute pressure signal; means responsive to said trailing electrical signal wave forms and said engine manifold absolute pressure signal for producing an ignition signal when the potential level of each of said trailing electrical signal wave forms has increased to that of said engine manifold absolute pressure signal; and circuit means responsive to said dwell time and ignition signals for completing and interrupting, respectively, an energizing circuit for said primary winding of said ignition coil.

3,972,311

ELECTRONIC CHOKE CONTROL

Peter S. DePetris, 2004 LaSalle Ave., Niagara Falls, N.Y. 14301

Filed Nov. 20, 1974, Ser. No. 525,670
Int. Cl.² F02D *11/08*; F02M *1/10*, *23/04*
U.S. Cl. 123—119 F **10 Claims**



1. In an engine having a carburetor choke valve, temperature responsive thermostat means for holding said choke valve closed at low temperatures and for opening said choke valve at higher temperatures, and a source of electric power, the improvement comprising:

electrical heating means in heat conductive relation to said thermostat means for heating the same; and

temperature responsive switching means in series with said source and said electrical heating means, said switching means being mounted in heat conductive relation to a portion of said engine and arranged to be conductive when said portion is above a predetermined temperature and to be non-conductive when said portion cools to a value below said predetermined temperature whereby to maintain current flow from said source through said heating means as long as said portion is above said temperature, irrespective of operation of said engine.

3,972,312

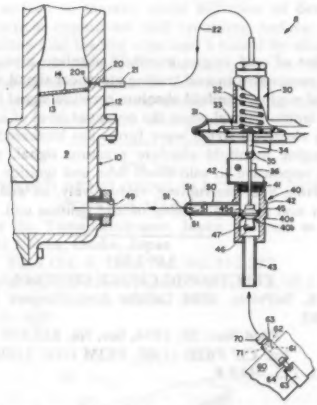
EXHAUST GAS RECIRCULATION CONTROL BY HIGH PORT ACTUATED DIAPHRAGM

Brooks Walker, 1280 Columbus Ave., San Francisco, Calif. 94133

Continuation of Ser. No. 438,699, Feb. 1, 1974, abandoned. This application Aug. 8, 1975, Ser. No. 603,037

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **8 Claims**



1. An exhaust gas recirculation system for a reciprocating piston internal combustion engine of the kind having a carburetor with a high port adjacent and upstream of the leading edge of a butterfly in the carburetor intake conduit when in the engine idle condition and an exhaust gas recycle conduit for recycling a part of the exhaust gases from the engine exhaust outlet back to the engine induction inlet, said system comprising

valve means in the recycle conduit comprising an annular valve seat having a radially extending seating surface and a short axially extending cylindrical bore providing a single opening through which all of the exhaust gas recirculation flow in the recycle conduit must pass to get into the engine induction inlet,

said valve means also comprising a movable axially elongated valve element with an axially extending body of smaller diameter than said bore and having at one end a radially extending flange for engaging said seating surface in a seated position of said valve element, said body joining said flange at a narrow neck and continuously and gradually flaring away therefrom toward an opposite end portion of slightly smaller diameter than said single opening,

control means responsive to suction at the high port for positioning the valve element,

said valve element thereby restricting said opening to flow of exhaust gas through the conduit to a first minimum in a seated first position of the valve element corresponding to suctions at said high port in the range of 0–7 inches mercury below atmosphere existing at both engine idle and at or near wide open throttle at said high port, said opposite end portion restricting flow to a second restricted minimum opening in a second position of the valve element corresponding to engine intake suctions in the range of 15–18 inches mercury existing at level stable cruises at speeds of 50–70 mph with normally advanced spark, said second minimum opening still providing a substantial passage for exhaust gas recirculation flow,

the flaring of said body continuously and gradually cooperating with said single opening to gradate the clearance between said body and said single opening at relatively high intake suctions in substantially all positions of the valve element between said first and second positions, said gradated clearance being greatest at suctions approaching 7 inches mercury below atmosphere and gradually and continuously being reduced at the suction approahes the range of 15–18 inches,

said movable valve element thereby progressively reducing the size of the clearance for the passage of exhaust gas recirculation flow through the valve means with progressive increase of intake suctions below atmospheric pressure at the high port between 8 inches mercury and 15 inches mercury below atmospheric pressure.

3,972,313

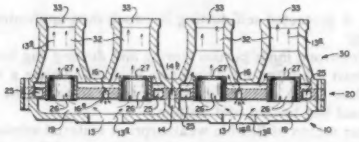
METHOD AND APPARATUS FOR HEATING AN INTAKE SYSTEM ON AN INTERNAL COMBUSTION ENGINE

Frederick J. Marsee, Clawson, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 26, 1973, Ser. No. 428,458

Int. Cl.² F02M *31/00*

U.S. Cl. 123—122 A **12 Claims**



1. In combination with an internal-combustion engine an apparatus for heating the air-fuel mixture and/or the idle air-fuel mixture of said internal-combustion engine having one or more cylinders prior to the entrance of the air-fuel mixture and/or idle air-fuel mixture into the cylinders of the engine comprising,

a. heat exchanger means for heating said air-fuel mixture and/or said idle air-fuel mixture, said heat exchanger means including

i. internal chamber means through which hot exhaust gases flow,

ii. at least one exhaust gas inlet through which said gases enter said chamber means and at least one exhaust gas outlet through which the exhaust gases exit said chamber means,

iii. interior walls disposed in said internal chamber means, said walls defining a plurality of generally cylindrical passage means extending through said internal chamber means,

iv. tube means disposed in said passage means through which said air-fuel mixture and/or idle air-fuel mixture flows,

b. engine mounting plate means connected to said heat exchanger means and disposed downstream thereof for connecting said heat exchanger means to said engine and including hollow chamber means generally aligned with said tube means for receiving said air-fuel and/or said idle air-fuel mixture heated by said heat exchanger,

c. carburetor mounting plate means connected to said heat exchanger means and disposed upstream thereof for

connecting at least one carburetor means to said heat exchanger means and including chamber means for receiving said air-fuel and/or said idle air-fuel mixture from said carburetor means, and

d. means for conducting exhaust gases from said engine to said heat exchanger means.

3,972,314

FUEL INJECTION SYSTEM

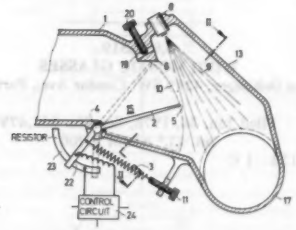
Roger Dupont, La Varenne St. Hilaire, France; Konrad Eckert, Stuttgart-Feuerbach, Germany; Heinrich Knapp, Leonberg-Silberberg, Germany, and Wolf Wessel, Schwieberdingen, Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Oct. 3, 1974, Ser. No. 511,357

Claims priority, application Germany, Oct. 3, 1973, 2349669

Int. Cl.² F02M *39/00*

U.S. Cl. 123—139 AW **29 Claims**



1. In a fuel injection system for externally ignited internal combustion engines having at least one fuel injection location in an air induction tube having a junction leading to individual cylinders, and means for metering of fuel which is independent of air conditions prevail prevailing immediately adjacent to the injection location, the improvement comprising air flow control means mounted within said induction tube and comprising an air guiding flap pivotably mounted on one side within said induction tube and, as seen in the flow direction, ahead of said injection location, said flap defining an air nozzle with a portion of the wall of said induction tube near said injection location for controlling the effective cross-sectional area of said induction tube with respect to said injection location, said nozzle serving to bring air to a high velocity, said fuel injection location including a fuel injection nozzle being disposed ahead of said junction of said air induction tube leading to the individual engine cylinders as seen in the flow direction and downstream of said air nozzle for injecting fuel toward said junction, whereby the air guiding flap defines a pivotal arc with its free end nearly touching the surface of a cone defined by the injected fuel, the high velocity air impinges immediately or injected fuel, enveloping the same, and the air-fuel mixture preparation is effected without wetting of the induction tube inner wall and the means for bringing the air to a high velocity.

3,972,315

DUAL ACTION INTERNAL COMBUSTION ENGINE IGNITION SYSTEM

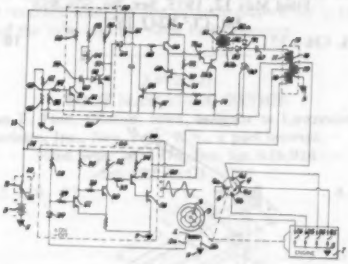
Curtis D. Munden, and Robert E. Campbell, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 21, 1974, Ser. No. 516,220

Int. Cl.² F02P *1/00*

U.S. Cl. 123—148 E **4 Claims**

1. A dual action internal combustion engine ignition system for use with an engine having at least one ignition arc gap in communication with each combustion chamber across which an ignition arc is struck to initiate combustion within the chamber, comprising: an ignition coil having first and second discrete primary windings and a secondary winding in which a high ignition potential of sufficient magnitude to strike an ignition arc is induced upon a rapid rate of change of linking magnetic flux; an ignition coil primary winding energizing circuit for a selected one of said ignition coil primary windings through which energizing current flows upon the completion thereof; means for completing and abruptly interrupting said ignition coil primary winding energizing circuit in timed relationship with an associated engine; an electrical circuit of the type which is electrically triggerable to a condition of operation during which a potential signal is present upon the output circuit thereof for a predetermined period of time and is then



terminated, said electrical circuit being so triggered in response to each interruption of said ignition coil primary winding energizing circuit; a capacitor; charge potential generating circuitry under the control of said potential output signal of said electrical circuit for producing a direct current potential in response to the termination of said potential signal and for impressing said direct current potential across said capacitor to place a charge thereupon; and a discharge circuit for said capacitor including the other one of said ignition coil primary windings and an electrically operable electrical switching device which is operated to the electrical circuit closed condition in response to each interruption of said ignition coil primary winding energizing circuit to establish said discharge circuit for said capacitor through the said other one of said primary windings of said ignition coil.

3,972,316

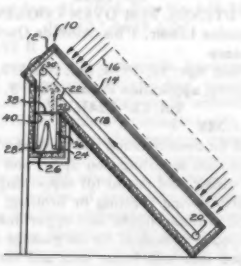
SOLAR ENERGY COLLECTOR WITH MOVING BELT ABSORBER

Kalil A. Alkasab, Wheaton, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed July 17, 1975, Ser. No. 596,691

Int. Cl.² F24J *3/02*

U.S. Cl. 126—270 **8 Claims**



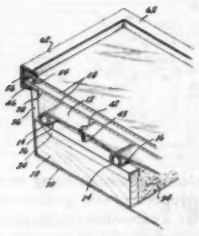
1. A solar energy collection apparatus comprising a housing forming an energy collection chamber, a belt-like absorption

member mounted for movement within said housing, a plurality of guide members for mounting said absorption member in said housing, a heat exchanger carried by said housing and located remotely from said collection chamber, a plurality of guide members for mounting said absorption member in said heat exchanger and cooperating with the guide members in the housing for permitting the absorption member to continuously tra- .l from the housing to the heat exchanger and back to the housing, and drive means for driving said absorption member.

3,972,317
SOLAR FLUID HEATER

Robert George Gallagher, El Cajon, Calif., assignor to Energy Systems, Inc., El Cajon, Calif.

Filed May 12, 1975, Ser. No. 576,853
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **10 Claims**



1. A solar heat collector panel for placement between a pair of fixed positioned juxtaposed fluid carrying conduits for solar energy transfer therebetween, said conduits carried by support members, said panel comprising:

a hinge member positioned along the upper longitudinal center line thereof;

a pair of panel members, one of said panel members positioned on each side of said hinge member and forming an integral structure therewith, said panel members sloping downward from the hinge member to their outer edges;

curvi-linear channel portions formed at said outer edges of said panel members for mating with said conduits; and

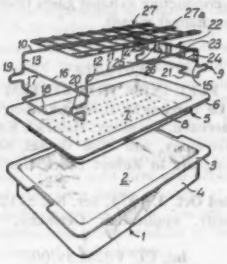
a biasing means for forcing the center of said hinge member toward said support member thereby hinging the portion of said panel members adjacent said hinge member downward biasing said curvi-linear channel portion against said conduits.

3,972,318
UTENSIL FOR OVEN COOKING

Jacques, Antonine Lenoir, 1 bis, Allee de Quebec, Massy (Essonne), France

Filed Apr. 10, 1974, Ser. No. 459,619
Claims priority, application France, Sept. 5, 1973, 73.31951
Int. Cl.² F24H *1/22*
U.S. Cl. 126—348 **14 Claims**

1. A utensil for oven roasting and broiling of foods comprising in combination superimposed upper and lower conformingly shaped dishes, and means for supporting the food above said upper dish during roasting or broiling, said lower dish being adapted to retain fluids, said upper dish having at least one hole formed in its bottom for the passage of fats and fluids from said food into said lower dish and for the passage of moisture outwardly from said lower dish about said food, each of said dishes having a peripheral side wall terminating in an outwardly flanged edge, the flanged edge of said upper dish mating with the flanged edge of said lower dish, clamping means engaging about at least a portion of said flanged edges

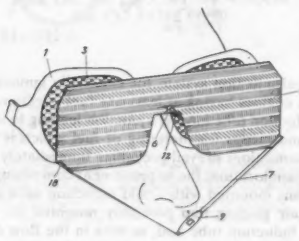


for securing said superimposed dishes closed about their periphery.

3,972,319
WIND MOSAIC GLASSES

Peter Jean Dehlinger, 4219 SW. Condor Ave., Portland, Oreg. 97201

Filed Jan. 26, 1976, Ser. No. 652,479
Int. Cl.² A61M *21/00*
U.S. Cl. 128—1 C **4 Claims**



1. Novelty glasses by which the wearer can visualize the rate and evenness of his breathing, comprising:

a. a frame;

b. a projection plate rotatably attached to the frame, said plate overlapping the visual field of both of the wearer's eyes;

c. a shape-retaining nose strap attached to said plate; and

d. a nose sail held by the nose strap in such position that the nose sail intercepts the nose-exhaled breath of the wearer, causing the attached projection plate to rotate slightly away from its equilibrium position.

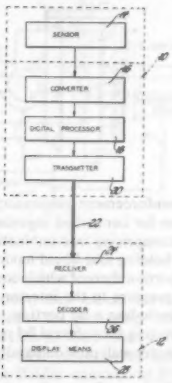
3,972,320
PATIENT MONITORING SYSTEM

Gabor Ujhelyi Kalman, P.O. Box 95, Farmington, Conn. 06032

Filed Aug. 12, 1974, Ser. No. 496,491
Int. Cl.² A61B *5/04*
U.S. Cl. 128—2.1 A **36 Claims**

1. A patient monitoring system for plural persons, said system comprising plural individual monitor units each being adapted to be associated with a different person and movable therewith, each unit including a sensing means adapted to be operatively connected with the associated person and responsive to a body condition to produce a body condition signal, signal processing means connected with the sensing means and including limit detecting means for producing a recurrent

alarm signal each time the body condition signal deviates beyond a predetermined limit, first memory means storing the value of said limit and connected with said limit detecting means, each unit also including a signal transmitting means adapted to transmit an emergency message comprising at least one occurrence of an identifier code corresponding to said monitor unit, each said emergency message having a duration which is several times shorter than the interval between alarm signals, second memory means for storing said identifier code, control means connected between said second memory means and said signal transmitting means for applying said emergency message to the transmitting means each time said alarm signal occurs, said control means being exclusively responsive to said alarm signal for initiating transmission of said emergency message, said control means of each monitor unit being



independent of the other monitor units of the system with the respective alarm signals occurring independently so that the respective emergency messages of two monitor units may be initiated at any time relative to each other but with at least one identifier code of at least one emergency message of each monitor unit occurring in the time interval between the emergency messages of the other unit, said system also comprising a central station including a signal receiving means, said control means causing the signal transmitting means to initiate transmission as aforesaid independently of any control by the central station, decoding means connected with the receiving means for producing a decoded identifier code in response to receipt of an emergency message, and annunciating means connected with said decoding means and responsive to a decoded identifier code for presenting the identifier code of the monitor unit which produced an alarm signal.

3,972,321
UPPER LIP MOUNTED RETAINING MEANS FOR MEDICAL-SURGICAL TUBES

John S. Proctor, 11924 Beltsville Drive, Apt. No. 33, Beltsville, Md. 20705

Filed Feb. 20, 1975, Ser. No. 551,262
Int. Cl.² A61M *25/02*
U.S. Cl. 128—348 **2 Claims**

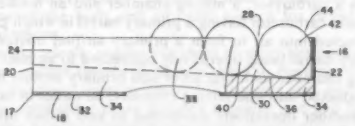
2. Improved retaining means for holding a medical-surgical tube in position on a patient while in use comprising in combination, a soft flexible elastic strip forming a cylindrical cuff for receiving said tube in place thereinside having a staging mount for holding the cuff affixed thereto in position extending from an upper lip of the patient, and a headband affixed to said staging mount to elastically retain it in place on said upper lip having a substantially rigid arm extending between said cuff and said staging mount in a plane substantially normal to said upper lip to space said cuff away from the patient's upper lip when in place to enter the tube into a facial opening wherein said normally extending arm extends from said staging mount in said plane at an angle of the order of 70° for resting on the upper lip with said arm extending downwardly to expedite

entry of the tube into the oral facial opening and with said mount reversed with said arm extending upwardly to expedite entry of the tube into the nasal facial opening.

3,972,322
FOOT MASSAGING DEVICE

William E. Finn, Clinton, Iowa, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Sept. 26, 1975, Ser. No. 616,914
Int. Cl.² A61H *15/00*
U.S. Cl. 128—57 **4 Claims**



1. A foot massaging device adapted to receive thereon the feet of a user, which comprises:

a. a housing having a base, a pair of upwardly extending end walls, a pair of upwardly extending sidewalls, an open top, and an interior chamber therein;

b. one of a plurality of wedge shaped members removably contained in said chamber, an upper inclined face of one said wedge shaped member extending downwardly from one said end wall to another said end wall; and

c. at least two cylindrically shaped member contained in said chamber and rollably engaging said upper face of said wedge shaped member, a circumferential periphery of each said cylindrically shaped member extending above the top edges of said sidewalls.

3,972,323
ORTHOPEDIC BANDAGE

Joseph H. Boricheski, deceased, late of South River, N.J. (by Helen Grabiek, executrix), assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Jan. 31, 1975, Ser. No. 546,160
Int. Cl.² A61F *5/04*
U.S. Cl. 128—91 R **3 Claims**

1. A highly conformable orthopedic bandage of improved green strength comprising: a textile-like, apertured, porous, nonwoven polyester fabric of essentially unbonded, mechanically entangled fibers randomly entangled with each other in a pattern of localized entangled regions interconnected by fibers extending between adjacent entangled regions and having a tensile strength of at least 1.0 pound per inch width of the fabric, an extent of elongation of from about 25 to about 100% in machine direction and of from about 40 to about 120% in cross direction of its relaxed length and width respectively, a fabric weight of from about 0.5 to about 3.0 ounces per square yard, a degree of openness defined by the presence of 50 to 500 apertures per square inch with an aperture size of from about 1/64 × 1/64 to about ⅛ × ⅛ inches;

said fabric impregnated with a settable plaster of Paris composition.

3,972,324

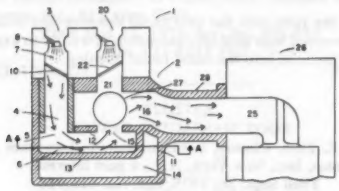
FUEL INDUCTION SYSTEM

Frederick J. Marsee, Clawson, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 498,960, Aug. 20, 1974, which is a continuation-in-part of Ser. No. 439,912, Feb. 6, 1974, abandoned. This application Sept. 23, 1974, Ser. No. 508,087

Int. Cl.² F02M 31/00

U.S. Cl. 123—122 AC 7 Claims



1. A fuel induction system for a spark-ignited multicylinder internal combustion engine, said system comprising in combination a carburetor, a mixing chamber and an intake manifold, said carburetor having a primary barrel in which gasoline is inducted into air to form a primary air/fuel mixture, said primary barrel being operatively connected to an inlet in said mixing chamber such that all of said primary air/fuel mixture is conducted into said mixing chamber, an outlet in said mixing chamber operatively connected to said intake manifold, said inlet and said outlet being positioned such that said primary air/fuel mixture reverses direction in passing in through said inlet and out through said outlet, said intake manifold being adapted to deliver said air/fuel mixture to said multicylinders said system including a secondary barrel in said carburetor adapted to deliver supplemental secondary air/fuel mixture during periods of high engine load, said secondary barrel being operatively connected to said intake manifold at a location which on a longitudinal axis is substantially the same as the location at which said outlet of said mixing chamber connects to said intake manifold.

3,972,325

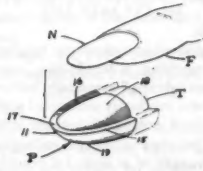
FINGERNAIL PROTECTOR AND METHOD

Dianne Bluestone, Los Angeles, Calif., assignor to Gene W. Arant and Juanita F. Arant, both of Los Angeles, Calif.

Continuation-in-part of Ser. No. 510,229, Sept. 30, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,524

Int. Cl.² A61F 13/00

U.S. Cl. 128—132 R 23 Claims



1. The method of protecting a long protruding fingernail during performance of manual activities by selecting a resilient cushion member adapted to fit within the cavity on the under side of the protruding nail portion, inserting said cushion member within said cavity, and adhesively securing the upper surface of the cushion member to the under surface of the fingernail.

3,972,326

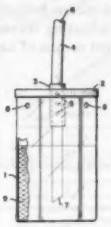
POSITIVE REINFORCEMENT RESPIRATORY INHALATION DEVICE

Peter Nelson Brawn, 36 Fairfield St., Pittsfield, Mass. 01020

Continuation-in-part of Ser. No. 435,877, Jan. 23, 1974, abandoned. This application Jan. 21, 1975, Ser. No. 542,795

Int. Cl.² A61M 16/00

U.S. Cl. 128—210 12 Claims



1. A positive reinforcement respiratory inhalation device, including provision for controlled ingestion of liquid into the mouth of a user, comprising in combination:

a container for holding said liquid having at least one opening in a wall portion thereof which communicates exterior atmospheric pressure to the interior of said container;

said container including a lid portion;

a first tube projecting though said lid portion and having an exterior perimeter wall portion fixedly attached to said lid portion;

a second tube having a first end projecting into said container to a depth adjacent the bottom of said container and a second end exterior to the container adapted to be inserted into the mouth of said user, said second tube being slideably fitted within said first tube for providing open communicating access between the interior and exterior of said container;

said second tube having a plurality of openings at longitudinally spaced intervals in the wall portion of said second tube slideably received by said first tube through which air may be admitted;

whereby said openings being so spaced longitudinally of said second tube are sequentially and cumulatively occluded by the wall portion of said first tube when said second tube is moved in a given direction to selected heights relative to said first tube so that when said container holds liquid and inspiratory effort is applied at the second end of said second tube varying volumes of liquid are withdrawn dependent upon the number of openings occluded by said wall portion.

3,972,327

RESPIRATOR

Heini Ernst, Witterswil, and Albert Guenin, Therwil, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 343,779, March 22, 1973, abandoned. This application Nov. 7, 1974, Ser. No. 521,801

Int. Cl.² A61M 16/00

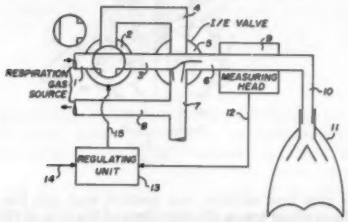
U.S. Cl. 128—145.8 30 Claims

1. A respirator for automatic regulation of flow and pressure of respiration gas during an inspiration and expiration phase by way of a single conduction path between a source of respiration gas and a patient, comprising:

a. a single conduction path having a first end adapted to be connected to a source of respiration gas and a second end adapted to be connected to a patient and, in serial ar-

rangement, measuring means forming part of said conduction path for determining the flow and pressure of respiration gas at a single measuring location proximate the said second end and converting the same into electrical signals;

single first valve means forming part of said conduction path and coupled to the source of respiration gas and adapted to be adjustable between inspiration and expiration positions and for controllably varying the flow and the pressure of the respiration gas during the inspiration phase and expiration phase; and single second valve means forming part of said conduction path for separating inspiratory and expiratory flow, said single second valve means being coupled between said single first valve means and said measuring means said second valve means



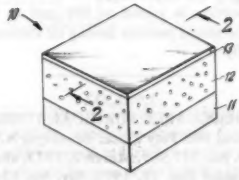
including an outlet, and means between said first and second valve means for providing fluidic connection of the first valve means to the patient during the inspiration phase when said first valve means is in said inspiratory position and for fluidic connection from the patient to said outlet during the expiration phase when said first valve means is in said expiratory position

b. electronic regulating means connected with the measuring means and said first valve means for comparing said electrical signals with selected values including standard values of inspiratory and expiratory flows and pressures and for generating a regulating signal indicative of a difference between said selected valves and said electrical signals and thereby controllably adjusting said first valve means for flows and pressures of respiration gas during the inspiratory and expiratory phases.

3,972,328
SURGICAL BANDAGE

James Ling Chen, East Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed July 28, 1975, Ser. No. 599,804
Int. Cl.² A61L *15/00*
U.S. Cl. 128—156 **17 Claims**

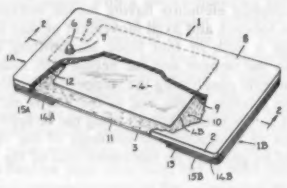


1. A bandage comprising a pressure sensitive adhesive layer, a layer of semi-open cell flexible polymeric foam attached to said adhesive layer, and a water-impervious flexible polymeric film attached to the opposite side of said foam layer wherein said adhesive layer comprises a rubbery elastomer having dispersed therein a water soluble or swellable hydrocolloid or mixture of hydrocolloids, tackifier, and plasticizer.

3,972,329
BODY ELECTRODE FOR ELECTRO-MEDICAL USE

John G. Kaufman, 858 Condor Drive, Burlington, Ontario, Canada

Filed Nov. 25, 1974, Ser. No. 526,681
Int. Cl.² A61B *5/04*
U.S. Cl. 128—2.06 E **10 Claims**



1. An electrode for use with electromedical equipment and adapted for attachment to a person's body, said electrode comprising:

a. manually elastically, stretchable, electrically insulating cover sheet member having an inner surface for facing toward the body and an outer surface for facing away therefrom;

b. an electrically conductive sheet member positioned with one surface thereof in juxta-position to the inner surface of the cover sheet member, a first minor area portion of the conductive sheet member adjacent one end thereof being fixedly secured to the cover sheet member, a second major area portion extending to the other end thereof remaining unsecured to said cover sheet member and thereby adapted to permit relative free movement between the cover sheet member and the electrically conductive sheet member, the electrically conductive sheet member being positioned within ther perimetric edge of the cover sheet member;

c. terminal means connected in electrically conducting relation to said conductive sheet member;

d. adhesive means disposed in fixed relation to said cover sheet member for removably attaching the electrode to the body, said adhesive means including first and second separate and distinct adhesive sections, said first section being positioned adjacent one end of the unsecured portion of the conductive sheet member, and the second section being positioned adjacent the opposite end of the unsecured portion of the conductive sheet member and in the vicinity of the secured portion of said conductive sheet member, between whereby said elastically stretchable cover sheet member can be stretched between isolated locations of adhesive attachment of the electrodes to the body and exert active force therebetween

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3,972,330
SYRINGE

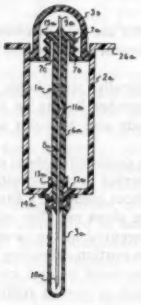
Harold S. Cloyd, Erie, Pa., assignor to Nosco Plastics, Inc., Erie, Pa.

Division of Ser. No. 98,226, Dec. 15, 1970, Pat. No. 3,766,919, and a continuation-in-part of Ser. No. 749,448, Aug. 1, 1968. abandoned. This application Aug. 10, 1972, Ser. No. 279,504
The portion of the term of this patent subsequent to Oct. 23, 1990, has been disclaimed.
Int. Cl.² A61M *5/00*
U.S. Cl. 128—220 **4 Claims**

1. In combination,

1. a cylindrical vial having a closed end and an open end sealed by a resilient stopper in slidable sealing engagement with the bore of the vial,

2. a hollow needle open at both ends,
3. an injection molded plastic body having a solid needle hub molded around a major portion of the length of the needle,
4. means for anchoring the needle in the hub,
5. one end of the needle being accessible for injection at one end of the needle hub and the other end of the needle being presented to the stopper at the other end of the needle hub,
6. a coupling element integral with the stopper,
7. another coupling element integral with said other end of the needle hub,
8. said coupling elements having means interengaging by relative rotation and axial movement of said elements to establish a push or pull force transmitting connection between the stopper and the needle hub, said other end of the needle penetrating the stopper and communicating with the interior of the vial as the vial is moved axially relative to the needle hub to bring the coupling elements together so thereafter the contents of the vial may be injected by pressure on the closed end of the vial,



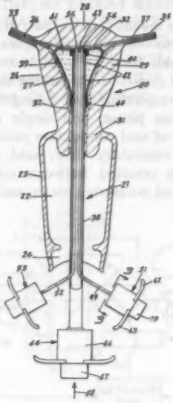
9. said plastic body, needle hub and other coupling element as molded having a runner leading to the coupling element and said plastic body, needle hub, other coupling element and runner as molded constituting a single piece of plastic,
10. the orthographic projection of said other coupling element on a plane at right angles to the axis of the needle hub being of larger outside diameter than the orthographic projection of said needle hub on said plane,
11. constructed so the needle hub, needle and said other coupling element may be injection molded and ejected as a unit from a simple mold with a runner leading to the coupling element,
12. and holding means interengaged with the vial and having a hub in telescoping relation with and fixed to the lower end of the needle hub and rotatably and slidably receiving and guiding the vial for holding the syringe while rotating the vial relative to the needle hub and to the holding means to engage the coupling elements and while exerting pressure on the closed end of the vial.

3,972,331
DISPENSING CATHETER

Lee R. Bolduc, Minneapolis, and Eugene A. Dickhudt, St. Paul, both of Minn., assignors to Population Research Incorporated, Minneapolis, Minn.

Continuation of Ser. No. 339,911, March 9, 1973, abandoned. This application Jan. 24, 1975, Ser. No. 543,877
Int. Cl.² A61M *1/00*
U.S. Cl. 128—232 **50 Claims**

27. Apparatus for dispensing substance means into the Fallopian tubes of a female body comprising: first and second means adapted to be placed in a uterine cavity; the first means including means for selective expansion for substantially completely filling the uterine cavity and making firm engagement with the inner wall of the uterine cavity including the fundus

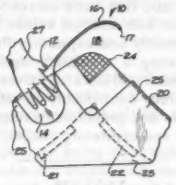


and the cornual areas, all regardless of the size of the uterine cavity; and the second means including means for providing a substance passage into the uterine cavity.

3,972,332
SURGICAL SHIELD

Paul E. Wakim, 2013 N. Gow, Wichita, Kans. 67203

Filed Sept. 22, 1975, Ser. No. 615,516
Int. Cl.² A61B *17/00*; A61F *5/04*
U.S. Cl. 128—303 R **4 Claims**



1. A sterile surgical shield utilized with power tools in bone surgery comprising:
a transparent sheet of semi-rigid plastic shaped in a shield portion, and a mounting portion;
the mounting portion having a curved saddle shape with a pair of downwardly extending legs adapted to snugly fit over and grip the upper leg;
the shield portion is joined at one end to the mounting portion, the shield portion having its forward end curved downwardly.

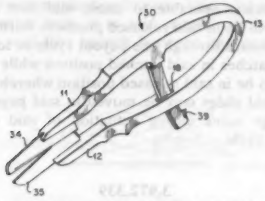
3,972,333
DISPOSABLE SURGICAL TOOL

Harry H. Leveen, 800 Poly Place, Brooklyn, N.Y. 11209

Division of Ser. No. 337,589, March 2, 1973, abandoned. This application Dec. 19, 1974, Ser. No. 534,487
Int. Cl.² A61B *17/32*, *17/30*; B26B *13/00*
U.S. Cl. 128—318 **1 Claim**

1. A hand operated device for manipulating a pair of relatively movable cooperating tools comprising a handle member including a pair of juxtaposed tool holding arms and a resilient flexible bowed portion inter-connecting said pair of tool holding arms at one set of adjacent ends thereof, guide means

including means defining an opening through one said tool holding arm confronting the other said tool holding arm, a guide arm attached at one end thereof to the other said tool holding arm, the other end of said guide arm extending through said opening and stop means on said guide arm engagable with the structure of said one tool holding arm upon parting movement of said pair of tool holding arms, said bowed portion of said handle member being internally stressed whereby this other set of adjacent ends of said tool holding arms are urged apart to cause said stop means to



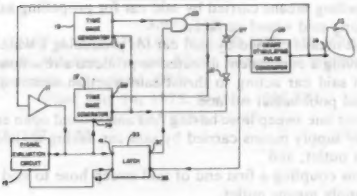
engage said one tool holding arm wherein said stop means includes a fixed non adjustable detent on said guide arm at the terminal end thereof remote from the other said tool holding arm and a pair of shearing blades attached to the ends of said tool holding arms remote from said bowed portion of said handle in which said detent limits parting movement of said tool holding arms to the initial part of mesh of said shearing blades by bearing against the underside of said one tool holding arm after having been pressed through said opening so that the shearing blades are in an initial meshing position.

3,972,334

DEMAND HEART PACER WITH DUAL TIME BASES

Geoffrey Gordon Wickham, Longueville, Australia, assignor to Telectronics Pty. Limited, Australia

Filed Feb. 10, 1975, Ser. No. 548,244
Int. Cl.² A61N *1/36*
U.S. Cl. 128—419 PG **16 Claims**



1. A heart pacer commprising terminal means for electrical coupling to a patient, electrical impulse generating means connected to said terminal means for applying electrical impulses to said terminal means, said electrica impulse generating means including first and second electrical impulse timing means simultaneously generating first and second predetermined timing periods respectively, said electrical impulse generating means further including enabling means for selecting one of said electrical impulse timing means to apply electrical impulses to said terminal means at its predetermined timing period.

3,972,335

MENTHOLATED CIGARETTE FILTER

Donald David Tiggelbeck, Pittsburgh, Pa., and Milton Manes, Kent, Ohio, assignors to Calgon Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 290,683, Sept. 20, 1972, abandoned, which is a continuation of Ser. No. 61,851, Aug. 6, 1970, abandoned. This application Dec. 4, 1975, Ser. No. 637,610
Int. Cl.² A24D *1/06*
U.S. Cl. 131—267 **13 Claims**

1. An improved granular activated carbon cigarette filter comprising granular activated carbon having an effective pore structure impregnated with a smoke-flavoring agent wherein the improvement consists of granular activated carbon in which at least about 50 percent of the pore volume and 60 percent of the surface area is blocked by impregnation with a non-toxic pore-modifying agent which is adsorbed and retained by the effective pore structure of the activated carbon in preference to the said smoke-flavoring agent with which the carbon is subsequently impregnated, provided, that the total amount of pore-modifying agent employed does not occupy all of the effective pore structure, but is such that sufficient effective pore structure remains for occupation by the subsequently impregnated smoke-flavoring agent; and in which the said smoke-flavoring agent occupies, to the extent of the amount thereof added, the remaining effective pore structure, that is, smoke-flavoring agent-carrying pore volume of the activated carbon not previously blocked by the said pore-modifying agent.

3,972,336

HAIR FIXATIVES BASED ON SULFONATED STYRENE POLYMERS

Frank A. Nowak, Jr., Bound Brook, and Frank Theodore Koehler, Jr., Plainfield, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 451,175, March 14, 1974, abandoned, and a continuation-in-part of Ser. No. 288,530, Sept. 13, 1972, abandoned. This application Apr. 18, 1975, Ser. No. 569,358
Int. Cl.² A45D *7/04*
U.S. Cl. 132—7 **8 Claims**

1. A process for setting hair comprising the steps of:
a. applying to the hair an effective amount of a solution of sulfonated polymer selected from the group consisting of a sulfonated polystyrene, a sulfonated interpolymer of styrene with a copolymerizable ethylenically unsaturated comonomer in a proportion of at least 50% styrene, by weight, and a soluble salt of said sulfonated polymers; and a solvent selected from the group consisting of water, ethanol, isopropanol and mixtures thereof, said sulfonated polymers having an average molecular weight of from about 6,000 to about 7,000,000 and being present in an amount of from about 0.1 to about 10.0%, by weight, of the total solution,
b. fixing the hair in a desired configuration, and
c. allowing the hair to dry while it is retained in said desired configuration.

3,972,337

HAIR CUTTING DEVICE

Anthony Cosmo Pomaro, 222 Bay 41 St., Brooklyn, N.Y. 11214

Filed May 1, 1975, Ser. No. 573,538
Int. Cl.² A45D *24/36*
U.S. Cl. 132—45 R **11 Claims**

1. A hair cutting device comprising the combination of:
a. a pair of scissors having cooperating cutting edges;
b. axially elongated post means;
c. means for securing one end of said post means to said pair of scissors; and
d. a comb-like member secured to the other end of said post means and positioned in a plane that is spaced from the

cutting plane of said pair of scissors, said comb-like member having a plurality of teeth the axes of which are substantially parallel to the cooperating cutting edges of said scissors.

3,972,338

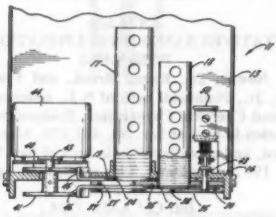
COIN CHANGER WITH DUAL-SLIDE PAYOUT MECHANISM

Donald E. Schmitt, Rockford, Ill., assignor to Reed Industries, Inc., Rockford, Ill.

Filed Dec. 11, 1974, Ser. No. 531,657

Int. Cl.² G07D *1/00*

U.S. Cl. 133—4 A **2 Claims**



1. A coin changer having a coin payout mechanism, said mechanism comprising a base, first and second coin storage tubes supported on said base, a first slide underlying said base and reciprocable back and forth in a linear path beneath said base from a home position to a payout position, said first slide having a first hole which is alined with said first coin tube when said first slide is in said home position and having a second hole which enables coins from said second tube to pass through said first slide when the latter is in either of said positions, a stationary divider plate underlying said first slide and having a first hole which is alined with the first hole in said fist slide only when the latter is in said payout position, said divider plate having a second hole which is alined with said second storage tube, a second slide underlying said divider plate and reciprocable back and forth in a linear path beneath said divider plate from a home position to a payout position, said second slide having a second hole which is alined with the second hole in said divider plate when said second slide is in said home position and having a first hole which enables coins from said first tube, said first hole in said first slide and said first hole in said divider plate to pass through said second slide when the latter is in either of said positions, a stationary bottom plate underlying said second slide and having a first hole which is alined with the first hole in said divider plate, said bottom plate having a second hole which is alined with said second hole in said second slide when the latter is in said payout position, each of said slides being operable when moved from its home position to its payout position to discharge a coin from its respective tube and through said bottom plate, means for biasing each of said slides from its home position to its payout position, a power operated cam means which is operable when actuated through one payout cycle to firt release said slides to the action of said biasing means and then to return to said home position any slide which has moved to said payout position, said cam means acting directly against and directly engaging said slides to return the slides, first and second latches associated with said first and second slides, respectively, and movable between latched and released positions to hold the respective slide in its home position and to free the slide for movement to its payout position, said first latch extending through said base and into said first slide, said second latch extending through said base, said first slide and said divider plate and extending into said second slide, and means operable to cause said first and second latches to both be in said released positions during actuation of said cam means through one payout cycle or to hold either one of said latches in said latched position while causing the other latch to be in said released position whereby either one or both of said slides may be moved to said payout position and discharge coins during actuation of said cam means through one cycle.

3,972,339

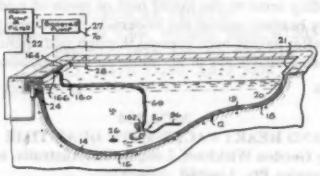
AUTOMATIC SWIMMING POOL CLEANER

Melvyn Lane Henkin, 19640 Green Briar Drive, Tarzana, Calif. 91356, and Jordan Myron Laby, 3940 Davana Road, Sherman Oaks, Calif. 91403

Division of Ser. No. 448,817, March 7, 1974, Pat. No. 3,936,899, which is a division of Ser. No. 275,173, July 26, 1972, Pat. No. 3,822,754. This application Oct. 14, 1975, Ser. No. 621,949

Int. Cl.² E04H *3/20*

U.S. Cl. 134—168 R **8 Claims**



1. A swimming pool cleaner including a car adapted to travel underwater on the surface of a pool vessel;

said car including a frame supported on traction means for engaging said pool vessel surface;

propelling means carried by said car for propelling said car along said vessel surface;

thrust means carried by said car for producing a water flow having a component directed to produce a reaction force on said car acting to thrust said traction means against said pool vessel surface;

at least one sweep hose having first and second open ends;

water supply means carried by said car having an inlet and an outlet; and

means coupling a first end of said sweep hose to said water supply means outlet.

3,972,340

TILT RESPONSIVE SHUT-OFF VALVE

Paul J. Miller, Richmond Heights, and Harold R. Daugherty, Lyndhurst, both of Ohio, assignors to The Weatherhead Company, Cleveland, Ohio

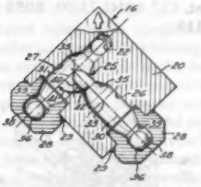
Filed Sept. 9, 1974, Ser. No. 504,347

Int. Cl.² F16K *17/36*

U.S. Cl. 137—38 **6 Claims**

1. A tilt responsive shut-off valve comprising a valve body having an inlet passage and an outlet passage and a shut-off passage, said shut-off passage having a first branch and a second branch, said first branch having a first gravity-

influenced tilt responsive valve means constructed and arranged to block communication between said inlet passage and outlet passage when said valve body is tilted in one direction about an axis from a normal position, said second branch having a second gravity-influenced tilt responsive valve means constructed and arranged to block communication between said inlet passage and outlet passage when said valve body is tilted from said normal position in another direction about said axis, each of said tilt responsive valve means including a valve seat and a shuttle closure member, said shuttle closure member of each of said tilt responsive valve means being disposed in a rest position spaced from its associated valve seat to open communication between said inlet and said outlet when said valve body is in said normal position, said inlet intersecting said first branch between its associated shuttle



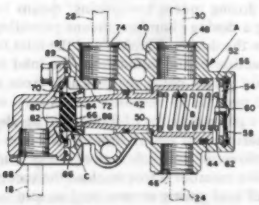
closure member and valve seat when said valve body is in said normal position, said first branch intersecting said second branch between its associated shuttle closure member and valve seat when said valve body is in said normal position, and said outlet intersecting said second branch downstream of its associated valve seat, said first and second branches each having portions thereof substantially inclined with respect to a horizontal direction when in a normal position whereby said valve is required to tilt through substantial angles in both directions from the normal position to block communication between the inlet and outlet passages by gravity influence on said valve means, said branches being arranged in a generally right angle configuration, with said first branch forming one leg of the right angle and said second branch forming the other leg of the right angle when viewed in a direction along said axis.

3,972,341

SHUTOFF AND EXHAUST VALVE FOR AIR BRAKES

William B. Wheless, Owosso, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed July 14, 1975, Ser. No. 595,581
Int. Cl.[2] F16K *31/42*
U.S. Cl. 137—102 **19 Claims**



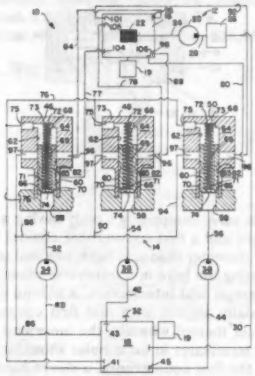
1. A valve comprising; a valve body having a hollow piston movable between first and second positions, said piston including an intermediate stepped portion, biasing means for normally biasing said piston to said first position, first and second ports communicating with one another past said stepped portion of said piston, third and fourth ports communicating with one another past one end portion of said piston, said piston having an opposite end portion communicating with atmosphere, movable valve means between said one end portion of said piston and said valve body for selectively blocking or establishing communication between said third and fourth ports and between said fourth port and the hollow interior of said piston past said one end portion thereof, said piston being movable from said first position to said second position under influence of pressure acting on said stepped portion thereof through said first port, in said first position of said piston said valve means being positioned for blocking communication between said third and fourth ports and between said fourth port and the hollow interior of said piston, in said second position of said piston said valve means being positioned for establishing communication between said third and fourth ports while blocking communication between said fourth port and the hollow interior of said piston upon application of pressure on said valve means through said third port and for establishing communication between said fourth port and the hollow interior of said piston while blocking communication between said third and fourth ports upon application of a higher to lower pressure differential across said valve means from said fourth port to said third port.

3,972,342

APPARATUS FOR DEAERATING FLUIDS

George James Jackson, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 20, 1974, Ser. No. 525,538
Int. Cl.[2] F16K *24/00*
U.S. Cl. 137—110 **6 Claims**



1. In a pressurized fluid-flow system including a primary reservoir, a valve for reducing the transfer of air into said primary reservoir of said system, comprising:

a body including a bore longitudinally therethrough ending in a seat adjacent one end thereof, a port communicating the other end of said bore with the exterior of said body, a hole through said body communicating with said bore intermediate said port and said seat, an opening through said body communicating with said bore intermediate the end thereof, and a fluid-flow entrance communicating with said seat;

a poppet-type spool slidably disposed in said bore, one end of said spool being adapted to sit against said seat, said spool including a restricted orifice communicating said one end thereof with said bore, said spool including a passageway therein intermediate the ends thereof;

means for biasing said one end of said spool to sit against said seat;

means communicating said entrance to receive fluid flow including entrapped air from said pressurized fluid-flow system upstream of said valve and direct said flow into said entrance and against said one end of said spool in opposition to the force exerted by said biasing means;

means for conducting air and fluid from said port and therefrom into said system upstream flow-wise of said valve when said spool is not displaced against the force exerted by said biasing means sufficiently to allow said fluid to flow along said bore and out said hole and said air and fluid have been passed through said orifice and into said bore and therefrom out of said port; and

means for conducting said fluid from said hole downstream to said reservoir when said fluid is conducted through said hole as said spool is displaced by the pressure of said fluid acting against the force of said biasing means sufficiently to allow said fluid to flow along said bore and out said hole;

said system including means communicating said opening via said passageway with said system upstream flow-wise of said valve when said spool is displaced against the force exerted by said biasing means sufficiently to allow said fluid to flow out said hole.

3,972,343

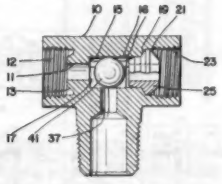
SHUTTLE VALVE

Donald G. Burge, Plainwell, Mich., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Continuation of Ser. No. 523,463, Nov. 13, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,189

Int. Cl.[2] G05D 7/01

U.S. Cl. 137—112 1 Claim



1. A shuttle valve comprising a body having a longitudinally extending bore and a first counterbore coaxial with said bore and of larger diameter than said bore, one end of said counterbore intersecting the bore in a transverse plane to form a first inlet valve seat at said intersection, a second counterbore in said body axially aligned with said first counterbore and of larger diameter thereof whereby the inner end of the second counterbore terminates in an annular shoulder adjoining and surrounding the first counterbore, a sleeve having a first portion press fitted within the other end of the first counterbore in sealing contact therewith and having a bore therethrough of substantially the same diameter as said body bore in axial alignment therewith, the inner end of said first portion intersecting said sleeve bore in transverse plane to form a second inlet valve seat at the latter intersection, said sleeve having a second portion of larger diameter than the first portion to form a shoulder therebetween that engages said annular shoulder in sealing contact therewith, said sleeve having a first tapered outer surface at an angle of about 2° with the longitudinal axis of the sleeve and whose end remote from said second portion is initially smaller in diameter than said first counterbore and whose end adjacent said second portion is initially larger in diameter than the diameter of said first counterbore whereby said press fitting and said first mentioned sealing contact is immediately adjacent said sleeve second portion and said annular shoulder, said body having a single outlet port transversely intersecting said first counterbore between said first and second seats and a valve element within said first counterbore and having a diameter that is a close slide fit with the wall of said first counterbore, said valve element being movable from a first position directly against said first valve seat wherein the valve element closes off inlet fluid flow through said body bore and permits fluid flow from said sleeve bore to said outlet port to a second position directly against said second valve seat wherein the valve element closes off inlet fluid flow through said sleeve bore and permits fluid flow from said body bore to said outlet port, and said body annular shoulder is tapered at an angle of about 30° to a transverse plane and said sleeve shoulder has a corresponding taper.

3,972,344

VALVE FOR WATER SPRINKLERS AND THE LIKE

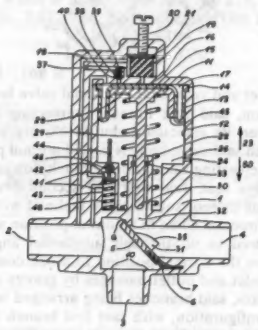
Michel Chauvigné, Cluses, France, assignor to Etablissements Carpano & Pons, France

Filed Dec. 31, 1974, Ser. No. 537,765

Claims priority, application France, Jan. 21, 1974, 74.01955

Int. Cl.[2] A01G 25/00; B05B 9/00

U.S. Cl. 137—119 7 Claims

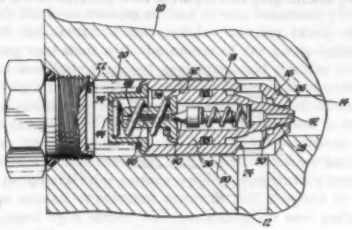


1. A valve assembly for water sprinkling and the like liquid distributing systems, comprising a valve body having an inlet and first and second outlets, a valve member able to close one of the outlets and simultaneously open the other, spring means biasing the valve member to close the second outlet and open the first, and volumetric dosing means for actuating the valve member to close the first outlet and open the second outlet after passage of a given volume of liquid through the first outlet, said dosing means comprising: means including a piston defining a dosing chamber, means providing communication between the dosing chamber and the inlet for allowing the flow of a fraction of the liquid from the inlet into the dosing chamber, said piston being reciprocable from a first position to a second position in response to delivery into the dosing chamber of a given quantity of liquid, and an element movable with the piston upon travel thereof between said first and second positions, in which first position of said movable element the valve member is free to close the second outlet under the action of said spring means, and in said second position said movable element engages said valve member and holds the valve member against the action of said spring means to close said first outlet.

3,972,345
PILOT OPERATED RELIEF VALVE

Kenneth Court, Birmingham, Mich., assignor to Sperry Rand Corporation, Troy, Mich.

Filed May 27, 1975, Ser. No. 581,015
Int. Cl.² F16K 31/12
U.S. Cl. 137—490 2 Claims

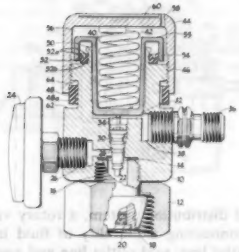


1. A pilot operated relief valve comprising a valve body having inlet and outlet passages with a valving orifice between them, a main valve member slidable in the body to open and close the orifice, means forming a first piston area on the main valve member exposed to inlet pressure acting in a valve-opening direction, means forming a second piston area on the main valve member and acting in a valve-closing direction, means biasing the main valve member toward closed position, a pilot relief valve connected to limit pressure acting on the second piston area, means including a first laminar flow orifice between the inlet passage and the second piston area, and a second laminar flow orifice leading from the second piston area to the pilot relief valve, whereby the effects of changes in viscosity of the fluid handled by the relief valve are minimized while at the same time oscillatory movements of the pilot relief valve are dampened.

3,972,346
PRESSURE REGULATOR

Alex F. Wormser, Marblehead, Mass., assignor to Wingaersheek, Inc., Peabody, Mass.

Filed Aug. 23, 1974, Ser. No. 500,132
Int. Cl.² F16K 31/12
U.S. Cl. 137—505.42 7 Claims

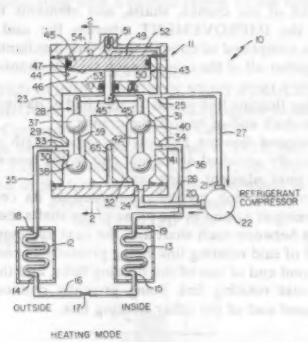


1. A fluid pressure regulator comprising:
a regulator body, said body having a tire valve
a fluid inlet passage for transmitting said fluid to said valve at a first pressure,
a fluid outlet passage for transmitting said fluid from said valve at a second, lower, pressure,
a valve outlet zone just downstream of said valve, and
a cylindrical sealing portion,
said valve intermediate of said fluid inlet passage and said fluid outlet passage,
said valve being the only valve between said fluid inlet passage and said fluid outlet passage and effective in continuing operation to reduce said first pressure to said second pressure,
a slide mounted in said regulator body for reciprocal motion relative thereto with its outside portions responsive to outlet pressure only,
said slide having a blind hole extending axially thereof,
said hole being of size large relative to the outside diameter of said slide, and oriented to provide in said slide a closed end immediately adjacent said valve outlet zone and an open end at the opposite end of said slide,
said slide closed end engaging said valve to move it in opening and closing directions,
a spring mounted in said hole, with one end supported by said closed end of said slide,
said slide, at its open end, having an outward extension in the shape of an inverted U, Said cylindrical sealing portion of said body extending into said inverted U, and closely adjacent to the innermost portion of said inverted U,
a cap,
said cap being mounted on said regulator body and engaging said spring at its end opposite said slide closed end to bias said spring thereagainst, and a U-ring,
the lips of said U-ring having their inner portions oriented to receive device outlet pressure, said U-ring positioned in said inverted U and extending between said slide and said cylindrical sealing porion of said regulator body.

3,972,347
REVERSIBLE REFRIGERANT SYSTEM AND FOUR-WAY REVERSING VALVE THEREFOR OR THE LIKE

Charles H. Perkins, Newtown Square, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 22, 1974, Ser. No. 526,099
Int. Cl.² F16K 11/16
U.S. Cl. 137—596.18 12 Claims



1. A four-way reversing valve comprising a housing means having two main ports and two reversible ports, said housing means having two pairs of valve seats respectively disposed on opposite sides of said reversible ports in communication therewith while each pair of valve seats has said main ports disposed outboard of the same and in communication therewith, four separate movable valve means for respectively controlling said valve seats so that either one of said main ports can be connected to one of said reversing ports and the remainder of said main ports can be connected to the other of said reversing ports, a single actuating means carried by said housing means, and a lever pivotally interconnected to said actuating means and to said valve means whereby two of said valve

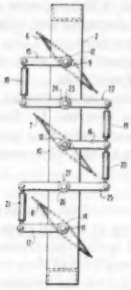
means are adapted to close their respective valve seats while the remaining two valve means open their respective valve seats.

3,972,348

TEMPERATURE COMPENSATING VALVE ASSEMBLY

Donald K. Hagar, Allentown, Pa., assignor to Mosser Industries, Inc., Allentown, Pa.

Filed June 12, 1975, Ser. No. 586,519
Int. Cl.² F23L *13/08*
U.S. Cl. 137—601 **6 Claims**



1. In a valve assembly having a housing that is constructed of a material which will expand when heated, and a plurality of closure elements inside the housing that can be rotated between valve open and valve closed positions, each element being mounted on its own shaft that is journaled in the housing and has an external end portion extending through the housing, said plurality of shafts being parallel to one another and lying in the same plane at equidistant intervals, each shaft having a crank extending radially from the external end portion thereof for rotating said shaft, all of said cranks being the same length, and said plurality of cranks being linked together by drive arm means so that rotation of one of the cranks causes all of the cranks, shafts, and elements to rotate in unison, the IMPROVEMENT wherein the said drive arm means is comprised of enough three-link mechanisms to connect together all of the cranks, each said mechanism comprising

a. a first floating link pivotally attached at its first end to the non-shaft end of one of the cranks,

b. a second floating link of the same length as the first, pivotally attached at its first end to the non-shaft end of the next adjacent crank, and

c. a rotating link pivotally mounted at its center to the housing at a point in the plane of the shafts that is equidistant between each shaft and the next adjacent shaft, one end of said rotating link being pivotally connected to the second end of one of the floating links, and the other end of said rotating link being pivotally connected to the second end of the other floating link.

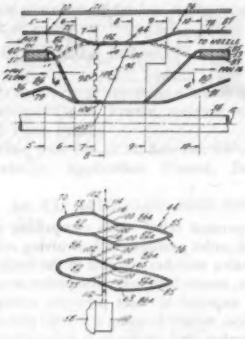
3,972,349

VARIABLE RATIO BYPASS GAS TURBINE ENGINE WITH FLOW DIVERTER

Julius W. Tumavicus, Old Saybrook, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed June 20, 1974, Ser. No. 481,439
Int. Cl.² F16K *11/00;* **F02K** *3.04, 3/12*
U.S. Cl. 137—609 **12 Claims**

10. A flow control system for inverting two flow patterns within a longitudinally extending annular fluid passageway comprising separate first and second duct means having adjacent annular cross sections at the entrance end and the exit end of said passageway and having a combined total cross-sectional area substantially equal to the cross-sectional area of said annular fluid passageway; wherein the entrance cross section of said first duct means is concentric with and surrounds the entrance cross section of said second duct means; and wherein said first and second duct means are shaped and arranged to invert the flow pattern such that the exit cross section of said second duct means is concentric with and surrounds the exit cross section of said first duct means, thereby discharging two separate flow patterns at the exit end



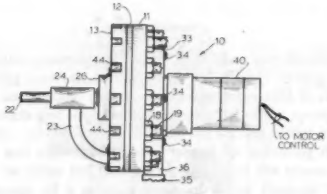
of said passageway in an annular adjacent relationship which is inverted from that existing at said entrance end of said annular fluid passageway; wherein said first and second duct means are fixed, and valve means comprising a plurality of flat, flapper valves actuatable to establish the inverted flow patterns or to join the entrance of said first duct means with the exit of said second duct means while the entrance of said second duct means is joined to the exit of said first duct means to thereby establish uninverted flow patterns.

3,972,350

ROTARY VALVE

John E. P. Pickett, 3323 Pinafore Drive, Durham, N.C. 27705

Filed Sept. 24, 1975, Ser. No. 616,145
Int. Cl.² F16K *11/06*
U.S. Cl. 137—624.18 **10 Claims**



1. In a fluid distribution system, a rotary valve useful for sequentially connecting a plurality of fluid inlet lines to a single fluid outlet line, said outlet line and each of said inlet lines having valve ends and remote ends, and said inlet lines being connected at their remote ends to a plurality of fluid sources, said system comprising in combination:

a. a frame;

b. an electric motor mounted on said frame and having a drive shaft extending therefrom;

c. a stationary plate having a front bearing surface and a rear surface and having a selected number of annularly disposed apertures circumferentially spaced at selected intervals with the number of such apertures being at least

as great as the number of said inlet lines and with each of said inlet lines at its valve end being connected at the rear surface of said plate to one of said apertures;

d. a substantially flat circular member having a front surface and a rear bearing surface and being secured at its center to said motor shaft for being rotatably driven thereby, said circular member being aligned on said shaft with the rear bearing surface of said circular member in contact with the front bearing surface of said stationary plate and with the center of said circular member axially aligned along said shaft with the center of the circle defined by said annularly disposed apertures, said circular member having a single opening connected to said fluid outlet line and positioned at a predetermined radial distance from the center of said member so as to be adapted to register over each of said annularly disposed apertures upon rotation of said member, said circular member having on its peripheral edge surface a plurality of surface irregularities spaced at selected intervals and adapted to being engaged by a sensor member riding on said peripheral edge surface;

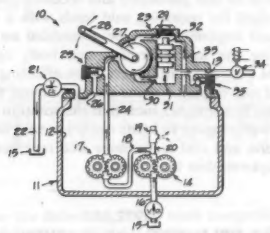
e. switch means electrically connected to said motor and having a sensor member positioned to ride on said peripheral edge surface, said sensor member being adapted to sense the presence of said irregularities and to open said switch means and switch off the power to said motor each time said sensor member senses one of said irregularities, said irregularities and annularly spaced apertures being selectively spaced so as to allow said opening to register over a selected one of said apertures at least a portion of the times when said motor is stopped by said switch means;

f. means for holding the rear bearing surface of said circular member and the front bearing surface of said stationary plate in firm surface-to-surface contact so as to prevent leakage between said opening and said apertures.

3,972,351
VISCOSITY COMPENSATING OIL BURNER CONTROL SYSTEM

Theodore Schultemaker, San Rafael, and Raymond B. Plass, Piedmont, both of Calif., assignors to Ray Oil Burner Co., San Francisco, Calif.

Filed July 30, 1975, Ser. No. 600,131
Int. Cl.² F16K 11/02
U.S. Cl. 137—625.47 **7 Claims**

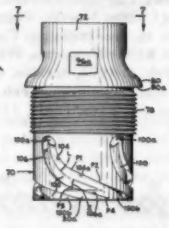


1. In a burner control system of the type comprising primary pump means for drawing oil into an inlet side thereof, secondary pump means, an outlet adapted for connection to a burner to communicate pressurized oil thereto and viscosity valve means intercommunicating between an outlet side of said secondary pump and said outlet for communicating a controlled rate of oil flow to said outlet, the improvement comprising conduit means intercommunicating an outlet side of said primary pump means with an inlet side of said secondary pump means directly and back pressure valve means communicating with said conduit means for maintaining oil pressure at the inlet and outlet sides of said secondary pump means at substantially equal levels.

3,972,352
DISCHARGE ELEMENT FOR A LIQUID-GAS SEPARATOR UNIT

Philip R. Bunnelle, Santa Clara, Calif., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 305,645, Nov. 10, 1972, Pat. No. 3,887,342. This application July 5, 1974, Ser. No. 486,136
Int. Cl.² F15D 1/14
U.S. Cl. 138—42 **21 Claims**

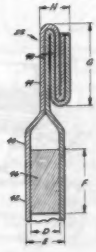


1. A discharge element, adapted for use in a separator unit, comprising: a cylindrical body having upper and lower portions, a vertical bore extending through a central portion of the body, the lower portion defining a gas collection chamber, at least one passage in the body communicating with the gas collection chamber and leading upwardly therefrom to a respective passage port on the exterior of the body, the passage port being adapted to discharge a stream of gas in a substantially upward direction, the gas collection chamber being defined by a circular body lip, at least one passageway formed in the circular body lip and extending in an upwardly curved path from the lower end of the lip to a respective passageway port communicating with a central region of the upper body portion.

3,972,353
PLEATED CONFIGURATION VENT STRUCTURE

Joseph C. McGuire, Kennewick, Wash., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Division of Ser. No. 394,054, Sept. 4, 1973, Pat. No. 3,838,557. This application June 27, 1974, Ser. No. 483,512
The portion of the term of this patent subsequent to Oct. 1, 1991, has been disclaimed.
Int. Cl.² F15D 1/00
U.S. Cl. 138—42 **5 Claims**



2. A vent structure comprising:
a tubing of predetermined length and size, said tubing in-

cluding an undeformed normally lower portion and a formed normally upper portion, and said upper tubing portion being flattened and folded against itself at least twice in a generally back and forth pleated configuration; and

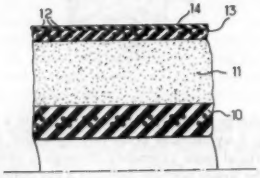
means provided in said upper tubing portion for separating its opposing proximate faces to prevent sintering and similar closures thereof whereby proper venting of fluid flow can be maintained through said vent structure to produce a reliable, long term operation, vent structure.

3,972,354

SELF-FLOATING FLEXIBLE PIPE

Jacques Champleboux, Clermont-Ferrand; Franck Tailhardat, Chamalieres, and Charles Moreau, Clermont-Ferrand, all of France, assignors to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes, France

Filed Feb. 5, 1974, Ser. No. 439,718
Claims priority, application France, Feb. 5, 1973, 43.04034
Int. Cl.² F16L *11/08, 11/12*
U.S. Cl. 138—103 6 Claims



1. A self-floating flexible pipe comprising:

a flexible pipe portion for conducting fluid,

a floatation layer of cellular floatation material around said pipe portion to assure floatation of the pipe,

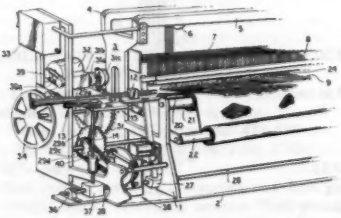
and a protective sheathing layer around said floatation layer and including a layer of elastic material and cables embedded in said layer of elastic material, said cables being wound and undulated in a sinusoidal pattern along the length thereof such that shocks and abrasions against the surface of the pipe are absorbed without permanent elongation of the cables.

3,972,355

WEFT INSERTING DRIVING MEANS FOR A SHUTTLELESS LOOM

Robert O. Sparling, Smithfield, R.I., assignor to Cox Foundry & Machine Company, Atlanta, Ga.

Filed June 13, 1975, Ser. No. 586,735
Int. Cl.² D03D *47/00*
U.S. Cl. 139—449 15 Claims



1. A loom comprising means for sequentially forming warp sheds, main motive means interconnected with said means for forming warp sheds for imparting operating movement thereto, weft inserting means operable in synchronism with said means for sequentially forming warp sheds for inserting weft threads therein, auxiliary motive means interconnected with said weft inserting means for imparting operating movement thereto, disjointable coupling means having a rotatable driving element coupled with said main motive means and a rotatable driven element coupled with said weft inserting means, said driving and driven elements being relatively movable axially from coupled to uncoupled relationship and being relatively rotatable independently of each other when uncoupled and being rotatable in unison only when disposed in predetermined angular and axial positions relative to each other, and a holding element arranged to engage one of said elements so as to prevent relative axial movement of said elements in a direction tending to uncouple said elements except when said elements are disposed in a predetermined angular relation to each other.

3,972,356

LEAD STRAIGHTENING, ALIGNING, AND SPACING IMPLEMENT FOR AN ELECTRONIC SEMI-CONDUCTOR PACKAGE

Torben Kjarsgaard, 15045 Saticoy, No. 138, Van Nuys, Calif. 91407

Filed Sept. 23, 1974, Ser. No. 508,075
Int. Cl.² B21F *1/02*
U.S. Cl. 140—147 6 Claims

1. An implement for use with a semi-conductor package having normally parallel leads extending from the package, comprising:

a body having an opening for receiving the package leads, generally hook-like resilient fingers on said body about the perimeter of said opening and projecting into said opening, and

said fingers having edges facing in the same circumferential direction of said perimeter and recesses opening through said edges for receiving said leads with a snap fit, such that said implement may be assembled on said leads by inserting the latter through said body opening in the regions between said fingers, then effecting relative rotation of said implement and package about the axis of said opening in a manner such that the rotation of said implement with respect to leads occurs in said circumferential direction and said leads enter said recesses laterally and are captivated in the recesses.

3,972,357

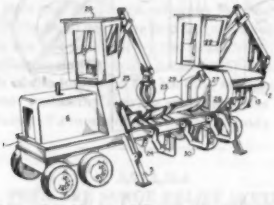
MOBILE DELIMBING AND SLASHING MACHINE

Robert Arthur Neal; Guy Savard, both of Doaktown, and Ronald Joseph Brodeur, Red Bank, all of Canada, assignors to Neal & Savard Forest Products Ltd., Doaktown, Canada

Filed June 20, 1975, Ser. No. 588,631
Claims priority, application Canada, Apr. 17, 1975, 224873
Int. Cl.² A01G *23/08*
U.S. Cl. 144—3 D 27 Claims

1. A mobile delimbing and slashing machine comprising in combination: a mobile main frame with a raised frame extension at the forward end thereof; delimbing means mounted on the underside of the frame extension at the forward end thereof for delimbing a felled tree; drawing roll means mounted on the underside of the frame extension adjacent to

and rearwardly of the delimbing means and adapted to engage the tree and draw it through the delimbing means to delimb the same; the delimbing and drawing roll means being adapted to be opened so as to release a tree held therewithin; cut-off means mounted on the main frame adjacent to and rearwardly of the drawing roll means and adapted to cut the delimbed tree into lengths; at least two tiltable tables positioned adjacent to and rearwardly of the cut-off means so as to support a cut-off length of tree; means to pick up and feed a felled tree through the delimbing means to the drawing rolls; said delimbing means consisting of an array of cylindrical high speed rotary bladed augers mounted on a ring-like bracket disposed in a plane substantially perpendicular to the travel path of a tree moving through the drawing rolls and onto the tiltable tables; at least one pivoted stop-plate mounted on the frame between a pair of tiltable tables, said stop-plate being adapted to be selectively placed in a raised position between said tables to impede passage of a tree trunk through the machine, so as to facilitate in predetermining the length of severed portions thereof; and means for driving and controlling all the operative means of the machine.

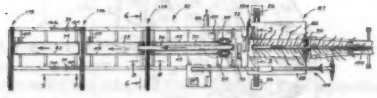


3,972,358

APPARATUS FOR DELIMBING TREES

Gilbert O. Kappler, 28330 S. Highway 213, Mulino, Oreg. 97042

Filed July 11, 1975, Ser. No. 595,075
Int. Cl.² A01G *23/08*; B65G *47/00*
U.S. Cl. 144—3 R **27 Claims**



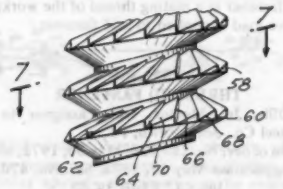
1. Apparatus for delimbing felled trees comprising
elongate support means for supporting a tree and providing a path along which the tree may be carried longitudinally of the path,
powered driving means for moving a tree under power longitudinally along said path,
shearing means for shearing limbs from such tree as it is carried under power along said path,
chipper means beneath said shearing means for receiving limbs sheared from a tree and reducing the same to chips, and
side shifter means downstream in said path from said shearing means operable to receive a delimbed tree and shift it laterally of said path to deposit the same in a region disposed laterally of said support means.

3,972,359

VIBRATION RESISTANT FASTENER

William J. Thomas, Glenside, Pa., assignor to Standard Pressed Steel Co., Jenkintown, Pa.

Filed May 17, 1974, Ser. No. 470,873
Int. Cl.² F16B *39/30*
U.S. Cl. 151—22 **7 Claims**



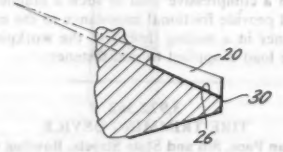
1. A vibration resistant fastener comprising a shank having at least a portion of its length provided with an external thread including a root and a crest, at least a portion of said thread formed with an irregular surface on the flank subjected to a compressive load when said fastener is engaged in a workpiece, said irregular surface configuration comprising a plurality of serrations in the form of teeth when viewed along a cylinder concentric with the longitudinal axis of said fastener, said teeth extending inwardly from the crest of said thread to termination inwardly of the pitch diameter at a point spaced from said thread root, each of said teeth comprising a ramp inclined in the direction of rotation of engaging said fastener in the workpiece, said ramp extending from the root to the crest thereof with a buttress extending between said crest and the root of an adjacent serration in a plane generally parallel with the longitudinal axis of said fastener, the height of said buttress between said crest and the root of an adjacent serration being greater at said thread crest than at said point spaced from said thread root, and each said buttress oriented at a skewed angle with respect to the radius from the longitudinal axis of the fastener to said serration.

3,972,360

VIBRATION RESISTANT FASTENER

James W. Cadwallader, Lansdale, Pa., assignor to Standard Pressed Steel Co., Jenkintown, Pa.

Filed May 17, 1974, Ser. No. 470,874
Int. Cl.² F16B *39/30*
U.S. Cl. 151—22 **17 Claims**



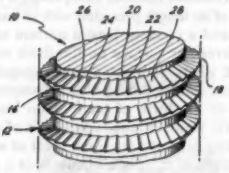
1. A vibration resistant fastener comprising a shank having at least a portion of its length provided with an external thread including a root and a crest, at least a portion of said thread formed with an irregular surface on the flank subjected to a compressive load when said fastener is engaged in a workpiece, said irregular surface configuration comprising a plurality of serrations in the form of teeth when viewed along a cylinder concentric with the longitudinal axis of said fastener, said teeth extending inwardly from the crest of said thread to termination inwardly of the pitch diameter at a point spaced from said thread root, each of said teeth comprising a ramp inclined in the direction of rotation of engaging said fastener in the workpiece, said ramp extending from the root to the

crest thereof with a buttress extending between said crest and the root of an adjacent serration in a plane generally inclined with respect to the longitudinal axis of said fastener, the height of said buttress between said crest and the root of an adjacent serration being greater at said thread crest than at said point spaced from said thread root, said teeth being formed on the flank subjected to a compressive load in such a manner that said teeth do not provide frictional inpedance to the engagement of the fastener in a mating thread of the workpiece until a compressive load is applied to said fastener.

3,972,361
THREADED FASTENER

Raymond Ollis, Jr., Mentor, Ohio, assignor to Standard Pressed Steel Co., Jenkintown, Pa.

Continuation of Ser. No. 257,730, May 30, 1972, abandoned. This application May 17, 1974, Ser. No. 470,848
Int. Cl.² F16B *39/30*
U.S. Cl. 151—22 **3 Claims**



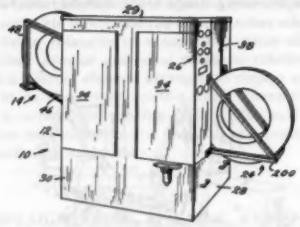
1. A vibration resistant fastener comprising a shank having at least a portion of its length provided with an external thread including a root and a crest, at least a portion of said thread formed with an irregular surface on the flank subjected to a compressive load when said fastener is engaged in a workpiece, said irregular surface configuration comprising a plurality of serrations in the form of teeth when viewed along a cylinder concentric with the longitudinal axis of said fastener, said teeth extending inwardly from the crest of said thread to termination inwardly of the pitch diameter at a point spaced from said thread root, each of said teeth comprising a ramp inclined in the direction of rotation of engaging said fastener in the workpiece, said ramp extending from a root to a crest thereof with a buttress extending between said crest and the root of an adjacent serration in a plane generally parallel with the longitudinal axis of said fastener, the height of said buttress between said crest and the root of an adjacent serration being greater at said thread crest than at said point spaced from said thread root, said teeth being formed on the flank subjected to a compressive load in such a manner that said teeth do not provide frictional impedance to the engagement of the fastener in a mating thread of the workpiece until a compressive load is applied to said fastener.

3,972,362
TIRE TRIMMING DEVICE

Hubert Julian Pace, 8th and State Streets, Bowling Green, Ky. 42101

Division of Ser. No. 167,785, July 30, 1971, Pat. No. 3,832,972. This application Aug. 6, 1973, Ser. No. 385,702
Int. Cl.² B29H *21/00*
U.S. Cl. 157—13 **56 Claims**

1. Tire processing apparatus including:
means for rotating a tire generally about the longitudinal axis thereof;
cutting knife means including two knife elements;
support means for the cutting knife means for moving the two knife elements of the cutting knife means in tandem transversely of the tire being rotated, in tangential trimming engagement with the exterior peripheral surface of the tire being rotated,
said cutting knife elements spaced from one another and each cutting element being pivotally mounted upon carriage means, said carriage means being mounted for oscillation upon a concavely arcuate track extending transversely to and astride the path of movement of the tread of the tire being rotated;
powered means mounted on said apparatus and linked to said carriage means for oscillating the carriage means back and forth along said track;

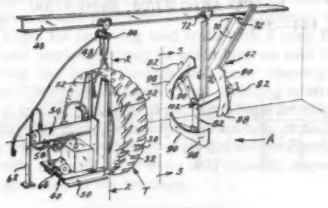


the two cutting elements mounted on the carriage such that when one cutting knife means is in contact with the tread of the tire being processed near one lateral extreme of the tread, the other cutting knife means is in contact with that sidewall of the tire being processed which adjoins the tread of said one lateral extreme and vice versa, whereby each cutter element pivots with respect to the tire being processed while in cutting contact with the tire being processed each time continued movement of the two cutter elements, by the support means, causes the respective cutter elements to traverse a respective lateral extreme of the tread.

3,972,363
MACHINE FOR CHANGING GIANT TIRES

Vallie D. West, 724 N. Washington St., and Jesse Kennedy, 201 S. Illinois Ave., both of DuQuoin, Ill. 62832

Filed Jan. 16, 1975, Ser. No. 541,442
Int. Cl.² B60C *25/06*
U.S. Cl. 157—1.26 **18 Claims**



1. A machine for breaking the beads on the sidewall of a tire away from tapered bead seats on a rim, the rim including a rim base having one of the bead seats thereon, a bead seat ring surrounding a portion of the rim and having another of the bead seats thereon, and flange adjacent to the tapered bead seat for restraining the sidewall, said machine comprising: backing members having a backing surface thereon of sufficient size to form a backstop for the rim; a press head movable toward and away from the backing surface and having shoes which align with the tire sidewall for engaging the sidewall when the head is moved toward the backing surface with the tire and rim positioned against the backing surface; force exerting means mounted in a fixed position with respect to the backing members and having a movable element which ex-

tends through the interior of the rim and is connected with the press head, whereby the force is applied to the sidewall of the tire to break the bead thereon away from its bead seat on the rim, the force exerting means being detachable from the press head so that the tire can be positioned against and removed from the backing members; and retaining means for gripping the tire flange adjacent to the bead seat of the bead seat ring when that ring is presented toward the press head and for preventing the bead seat ring from moving toward the backing surface as the shoes of the press head are forced against the tire sidewall which surrounds the bead seat rings, said retaining means including a rigid body and jaws which grip the flange on the bead seat ring, the rigid body projecting radially inwardly across the ends of the bead seat ring and the rim base when the jaws grip the flange, whereby the body abuts against the ends of the bead seat ring and the rim base as the force is applied to the tire sidewall by the press head, said retaining means further including tying means connected between the inner ends of the body and the backing members for preventing the inner ends from moving away from the backing members as a result of a moment applied to the body at the jaws.

3,972,364

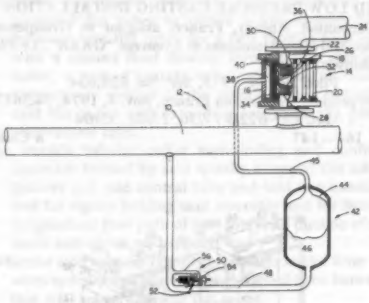
PRESSURE SURGE RELIEF SYSTEM

Richard S. Brumm, Orinda, Calif., assignor to Grove Valve and Regulator Company, Oakland, Calif.

Continuation of Ser. No. 473,001, May 24, 1972, abandoned. This application Mar. 6, 1975, Ser. No. 555,785

Int. Cl.² F16K *31/126, 31/365*

U.S. Cl. 137—485 **11 Claims**



1. A pressure surge relief system for a liquid-transporting pipeline comprising:

a surge relief line adapted for connection from a pipeline to a low pressure zone;

a surge reliever valve in said surge relief line;

a pressure responsive member operating said surge reliever valve;

a chamber exposed to said pressure-responsive member so that fluid therein biases said pressure-responsive member in one direction to close said surge reliever valve;

means for exposing said pressure-responsive member to fluid in said surge relief line to bias it in the opposite direction;

a pilot load duct adapted to be connected to said pipeline;

means for maintaining the pressure in said chamber at the pressure in said pilot load duct;

a large capacity control valve in said pilot load duct;

a bypass line around said control valve;

an orifice device in said bypass line; and

means responsive to surge characteristic in said pipeline for closing said control valve.

3,972,365

EXTRUDED PLASTIC FOLDING DOOR

Guy E. Dixon, Miami, Fla., assignor to Panelfold Doors, Inc. (Entire), Miami, Fla.

Filed Apr. 13, 1972, Ser. No. 243,734

Int. Cl.² E05D *11/08, 11/06, 7/00*

U.S. Cl. 160—183 **13 Claims**

1. A folding closure comprising a plurality of elongated panels, hinge means connecting the vertical edges of adjacent panels together whereby the panels can be extended or retracted, each hinge means comprising a generally cylindrical member on one edge of each panel and forming a male hinge element, and a generally hollow channel-shaped member on the other edge of the panel and forming a female hinge element, said channel-shaped member projecting laterally from both surfaces of the panel and including a vertical entrance throat, said cylindrical member including a vertical entrance throat so that when the entrance throats are registered in end to end relation, the hinge elements may be interconnected by longitudinal movement of the panels to a position alongside of each other, the positioning and dimensions of the entrance throats being such as to prevent lateral movement and disengagement of the hinge elements, said channel-shaped member including inwardly extending flanges opposite to the entrance throat for engaging the external periphery of the cylindrical member during pivotal movement of the panels.

3,972,366

METHOD OF AND APPARATUS FOR MAKING COMPOUND ROLLS

John M. Dugan, Pittsburgh, Pa., assignor to Blaw-Knox Foundry & Mill Machinery, Inc., Pittsburgh, Pa.

Filed Nov. 29, 1974, Ser. No. 528,408

Int. Cl.² B22D *27/02*

U.S. Cl. 164—52 **10 Claims**

1. A method of making a compound roll to be used as a rolling mill roll, said compound roll having a shell portion of a first material of high hardness and wear resistance and a core portion forming the roll center core and neck sections of a second material, comprising the steps of pre-casting the shell portion in the form of a hollow cylinder having predetermined external and thickness dimensions, setting up a mold assembly with the shell portion on top of a mold section for forming a neck of the roll with the longitudinal axis of the shell portion

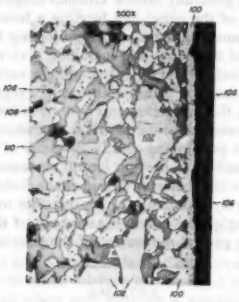
and mold section extending vertically, positioning an electrode of an electro-slag melting unit within the interior of the shell portion and the neck mold section, said electrode being pre-formed out of a material having the chemical composition to produce said core portion of said second material on melting and resolidification, and effecting the melting of said electrode so as to fill the interior of said shell portion and the interior of said mold section.

3,972,367

PROCESS FOR FORMING A BARRIER LAYER ON CERAMIC MOLDS SUITABLE FOR USE FOR HIGH TEMPERATURE EUTECTIC SUPERALLOY CASTING

Michael F. X. Gigliotti, Jr., Scotia, and Charles D. Greskovich, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 11, 1975, Ser. No. 586,049
Int. Cl.² B22C 3/00, 9/12, 1/00
U.S. Cl. 164—72 54 Claims



1. A method for forming a barrier layer at the mold-metal interface in a mold suitable for the casting and directional solidification of superalloys therein including the process steps of:

placing a mold made of a material comprising a first refractory oxide bonded together by silica within a furnace;

introducing a controlled prevailing atmosphere into the furnace, and

heating the mold in the controlled prevailing atmosphere at an elevated temperature for a sufficient period of time to at least dissolve some of the first refractory oxide into the silica.

3,972,368

METHOD AND APPARATUS FOR AUTOMATICALLY CASTING NON-FERROUS METAL

Takahiro Kikkawa; Toshinori Hirata, both of Higashi; Waichi Miyaji, Kawaguchi; Kouichi Tokunaga; Hidetosi Otu, both of Kamagaya; Mikiya Tanigawa, and Yasuhiro Yamazaki, both of Hachinohe, all of Japan, assignors to Hachinohe Smelting Co., Ltd.; Mitsui Kinzoku Engineering Service Co., Ltd. and Mitsui Mining & Smelting Co., Ltd., all of Tokyo, Japan

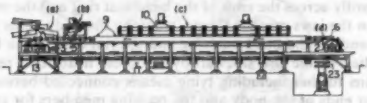
Filed Oct. 9, 1974, Ser. No. 513,290
Claims priority, application Japan, Aug. 8, 1974, 49-90915; Aug. 8, 1974, 49-90916; Aug. 8, 1974, 49-90917; Aug. 8, 1974, 49-90918; Aug. 8, 1974, 49-90919; Aug. 8, 1974, 49-90920
Int. Cl.² B22D 7/00, 9/00, 29/04, 43/00
U.S. Cl. 164—76 9 Claims

1. A method of continuously and automatically producing stacks of nonferrous metal ingots, comprising the steps of:

casting a predetermined volume of molten metal by a constant volume casting device in molds set on chain conveyor means;

producing ingots by driving the chain conveyor means by first moving the molds to a scum skimming device for skimming from the molten metal in each mold scum which foams to its surface and then moving the molds to cooling means for cooling the ingots;

releasing the ingots from the molds and forming the ingots into an ingot stack disposed on another conveyor means, said stack comprising a plurality of layers of ingots arranged in a vertically stacked relation with the ingots of the adjacent layers being arranged in two different patterns;



weighing the ingot stack by a weighing device after conveying the ingot stack to a weighing position by driving said last mentioned conveyor means;

driving said last mentioned conveyor means with said ingot stack thereon to a binding position after weighing is finished;

applying pressure to said ingot stack using a hydraulic pressing means to flatten said ingots; and

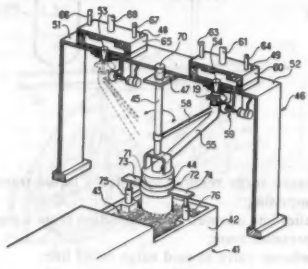
binding said ingot stack using a binding device.

3,972,369

RAPID LOW-PRESSURE CASTING INSTALLATION

Henri Carbonnel, Antony, France, assignor to Groupement pour les Activities Atomiques et Avencees "GAAA", Le-Plessis-Robinson, France

Filed Nov. 4, 1975, Ser. No. 628,624
Claims priority, application France, Nov. 4, 1974, 74.36579
Int. Cl.² B22D 17/30, 27/02, 35/04
U.S. Cl. 164—147 8 Claims



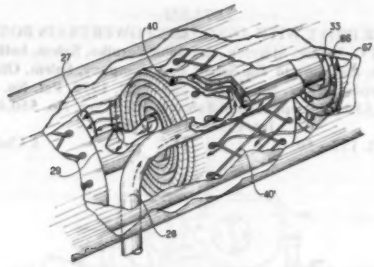
1. In a rapid low-pressure casing installation comprising a maintaining ladle containing a molten metal at least part of which is open to air, an electromagnetic pump partly immersed in that portion of the maintaining ladle situated in the open air, at least two moulds arranged on either side of the pump at a higher level than the maintaining ladle, an injection pipe and contact and interconnection means integral with the electromagnetic pump and means for the rapid locking of said injection pipe to said moulds, the improvement wherein: said at least two moulds are arranged at the same radial distance from the pump, outside the vertical line of the maintaining furnace and wherein means are provided for connecting said moulds each in turn to the pump through said rapid contact and interconnection means and said locking means.

3,972,370

HOT SOURCE HAVING SLIGHT BULK

Claude Malaval, 39 rue des Coquelicots, 92160 Antony, France

Division of Ser. No. 407,129, Oct. 17, 1973, Pat. No. 3,905,198. This application Oct. 25, 1974, Ser. No. 518,119
Claims priority, application France, Oct. 19, 1972, 72.37041
Int. Cl.² F28D 9/04
U.S. Cl. 165—163 3 Claims



1. A heat exchanger having slight bulk comprising:
a central tube,
a pair of thin wall flat tubes welded to said central tube in fluid communication therewith at circumferentially spaced locations and commonly spirally wrapped about said central tube,
spacers interposed between said commonly spirally wrapped flat tubes to define a longitudinal flow path between said flat tubes for a first fluid in heat exchange with a second fluid flowing through said thin wall flat tubes, a pair of outside tubes, each outside tube being respectively welded to the radially outer end of one of said flat tubes and extending longitudinally parallel to said central tube,
an outside tubular collar surrounding and confining an assembly formed by said spirally wrapped flat tubes, said spacers and said central tube and said two outside tubes and for rigidly holding said assembly and for limiting the longitudinal flow path of said first fluid outside of said flat tubes and about said spacer, and
wherein said spacers comprise gratings in the form of steel wires spirally wound about said central tube between said thin wall spirally wound flat tubes.

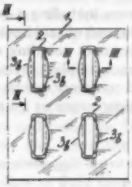
3,972,371

TUBE AND TUBE-PLATE ASSEMBLY

Alain Edouard Plegat, Asnieres, France, assignor to Societe Anonyme des Usines Chausson, Asnieres, France

Continuation of Ser. No. 354,468, April 25, 1973. This application Nov. 6, 1974, Ser. No. 521,531
Claims priority, application France, Apr. 26, 1972, 72.14847
Int. Cl.² F28F 9/04
U.S. Cl. 165—178 2 Claims

1. A tube and tube-plate assembly comprising a tube-plate having at least one tube passage of a substantially rectangular configuration and surrounded completely by a protruding collar, a tube having one end inserted through said passage and protruding beyond said collar, said tube having long and short sides delimiting substantially a rectangle of the same configuration as said collar to bear against the inner wall thereof, the end of said tube having an unbroken periphery, and said long sides of said tube ends having bent back portions at substantially the mid-points thereof, which portions are rounded over said collar toward said tube plate to define laterally, outwardly extending substantially semi-circular ears, the middle portions of which bear against said tube plate, said tube having an expanded portion adjacent the side of said tube-plate opposite said collar portions, said expanded portion of said tube having dimensions greater than the tube portion



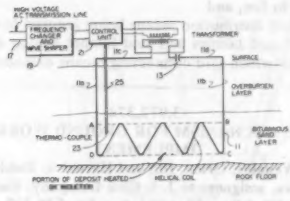
surrounded by said collar, whereby the outer wall of said tube and the inner wall of said collar are in close contact and said expanded portion prevents sliding of said tube with respect to said tube plate.

3,972,372

EXRACTION OF HYDROCARBONS IN SITU FROM UNDERGROUND HYDROCARBON DEPOSITS

Sidney T. Fisher, 53 Morrison Ave., and Charles B. Fisher, 2850 Hill Park Road, both of, Montreal, Quebec, Canada

Filed Mar. 10, 1975, Ser. No. 556,544
Int. Cl.² E21B 43/24, 43/25
U.S. Cl. 166—248 13 Claims



1. A method of extraction and processing in situ of hydrocarbons located in an underground hydrocarbon deposit, comprising:
heating a selected portion of said deposit by means of electric induction heating coils substantially surrounding said selected portion of said deposit to a temperature sufficient to vaporize or gasify at least some of the hydrocarbons located in said selected portion, and
collecting the said vaporized or gasified hydrocarbons.

3,972,373

FIRE EXTINGUISHER SYSTEM FOR VEHICLE

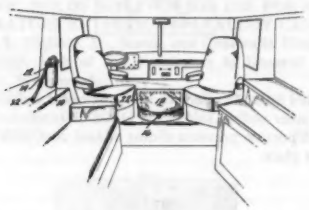
Kenneth B. Nichols, and Josephine E. Nichols, both of 1813 Towhee, San Marcos, Calif. 92069

Filed Aug. 25, 1975, Ser. No. 607,144
Int. Cl.² A62C 35/12
U.S. Cl. 169—62 5 Claims

1. A fire extinguishing system for an engine in a vehicle having engine enclosing means forming an engine compartment, said engine enclosing means including a covering member over the engine forming upper enclosing means for the engine and opening for engine access, comprising:
a. means forming fluid distribution means disposed under said covering member and having discharge openings to said engine compartment,
b. connecting means extending from said fluid distribution means to outside of said engine compartment and including inlet means,
c. a standard container of fire extinguishing fluid having discharge means including a hose operative to feed fire extinguishing fluid to said inlet means, whereby upon the

occasion of a fire in said engine compartment fire extinguishing fluid from said container can be discharged into said compartment without opening said covering member,

d. said discharge means including a quick-disconnect coupling member at the end of said hose and said inlet means being a quick-disconnect coupling member mating with said quick-disconnect coupling member at the end of said hose, whereby said container can be quickly connected to said fluid distribution means in event of a fire,



e. said vehicle having space for occupants and said covering member being a bonnet and being located within said space for occupants, whereby upon the occasion of a fire if said bonnet is opened to fight a fire in said engine compartment oxygen is supplied to the fire from said space for occupants and said space for occupants is exposed to fire, and

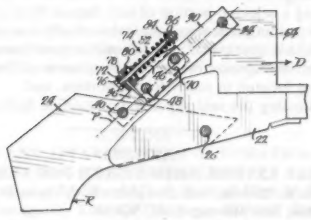
f. said fluid distribution means being secured to the underside of said bonnet and said bonnet having an opening through which said connecting means extends.

3,972,374

TRIP MECHANISM FOR GROUND WORKING IMPLEMENT

Phillip G. Venable, Orion, Ill., and Harold A. Ralston, Bettendorf, Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Dec. 23, 1974, Ser. No. 535,227
Int. Cl.² A01B *61/04*
U.S. Cl. 172—261 **12 Claims**



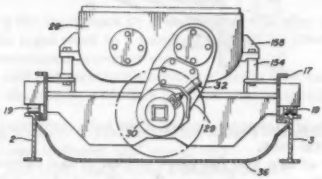
1. In an earthworking implement having a frame, a standard, pivotal means pivotally attaching the standard to the frame, and a trip mechanism between said frame and standard normally maintaining said standard in an earthworking position and accommodating pivotal movement about said pivotal means when excessive forces are developed on said standard, characterized by said trip mechanism including a first rigid link, a first pivot pin directly interconnecting said first link and said frame by a first pivot, a second rigid link, a second pivot pin directly interconnecting said second link and said standard by a second pivot, and a spring biased linkage mechanism located between said first and second links, and a first pivotal connection directly connecting said mechanism to a free end of said first link, a second pivotal connection directly connecting said mechanism to a free end of said second link, said spring biased linkage mechanism having stop means engaging one of said links and defining a first position for said first and second links where one of said pivotal connections is located on one side of a plane extending through said first and second pivots, said spring biased linkage mechanism accommodating movement of said one of said pivotal connections to an opposite side of said plane to allow said first and second links to respectively pivot about said first and second pivots when excessive forces are developed on said standard.

3,972,375

AUGER DRIVE WITH AUXILIARY POWERTRAIN BOXES

Ronald C. Deeter, Malvern, and John Pozniko, Salem, both of Ohio, assignors to The Salem Tool Company, Salem, Ohio

Division of Ser. No. 398,971, Sept. 20, 1973, Pat. No. 3,918,536. This application Feb. 18, 1975, Ser. No. 550,465
Int. Cl.² E21C *25/58*
U.S. Cl. 173—50 **5 Claims**



1. Auger apparatus comprising a frame, power supply means carried by said frame, rotatable auger drive means associated with said frame, and power train means adapted to transmit power from said power supply means to said auger drive means, said power train means comprising main power train means and a plurality of auxiliary power train means each adapted to transmit power to an auger drive means and from it to an auger included in a plurality of augers, each auxiliary power train means being connected to said main power train means by means adapted to transmit power from said main power train means through said auxiliary power train means to an auger drive means through a range of adjustable positions of said auxiliary power train means relative to said main power train means, said auxiliary power train means being so designed that the number of auxiliary power train means can be reduced to a single auxiliary power train means by removal of all except said single auxiliary power train means and by adjustment of said remaining single auxiliary power train means to permit the driving of a single auger drive means and a single auger, each of said auxiliary power train means being adjustable to different height levels and different lateral positions of its auger drive means relative to said frame to permit variations in the spacing between the augers of said plurality of augers driven from said auxiliary power train means and to permit the use of augers of different diameters to be used, said height level adjustability being independent of said lateral position adjustability of each auxiliary power train means and the auger drive means through which it transmits power.

3,972,376

ADAPTER ASSEMBLY FOR IMPACT TOOL UNITS WITH ROTATABLE OR OSCILLATABLE BITS

Vernon L. Price, 670 Hillcrest Drive, Reno, Nev. 89502

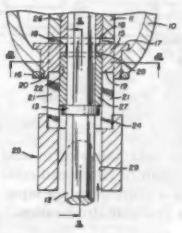
Continuation of Ser. No. 313,469, Dec. 8, 1972, abandoned. This application Sept. 6, 1974, Ser. No. 503,770
Int. Cl.² B25D *17/08*
U.S. Cl. 173—139 **6 Claims**

1. In combination a two-body adaptation of an impact tool device having a first body comprising a main support, a tool bit having a shaft and a workhead, means for mounting said tool bit for rotational and axial movement, said tool bit having

a shoulder disposed at a location along its shaft before its workhead, and a second body comprising separate means cooperating with the tool bit for imparting both axial impact and rotational forces thereto including

an adapter assembly mounted on said main support body and comprising:

a bearing support on said main support in a fixed axial position and carrying a bearing through which said tool bit axially extends with its shoulder below the bearing,



said bearing including means for preventing rotation of said bit relative thereto while allowing the bit to slide axially therein;

said bearing including thrust bearing means for engaging said tool bit shoulder so as to hold the tool bit down against the work under impact but permit turning of the bit about its axis and

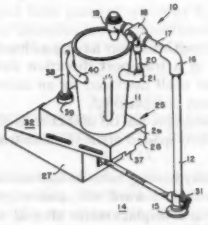
an elongated, slotted chuck forming a part of said second body which extends through said fixed main bearing support of said first body for axial movement relative thereto to prevent transmission of impact forces to the support.

3,972,377

AUTOMATIC SHUT-OFF DEVICE FOR FLUID DISPENSING FAUCET

Angelo Esposito, 217 N. Santa Cruz Ave., Los Gatos, Calif. 95030

Filed Feb. 27, 1975, Ser. No. 553,820
Int. Cl.² G01G *13/02*
U.S. Cl. 177—117 **1 Claim**



1. An automatic shut-off device for a fluid dispensing faucet of the type that includes a lever which is moved to one side by a container placed in position to receive fluid from the faucet with the lever movement causing fluid to flow from the faucet, said device comprising:

a platform positioned in a first position to hold the container in position to receive fluid from the faucet;

a base member supporting said platform, said platform and base member having abutting surfaces extending in a plane at an angle to the platform surface such that downward pressure on the platform will cause movement thereof relative to the base member in a direction away from the faucet;

spring means biasing the platform to the first position such that a container abuts the lever, said spring means being operable to allow movement of the platform to a second position spaced from the faucet when the container is filled with fluid for moving the container away from the lever;

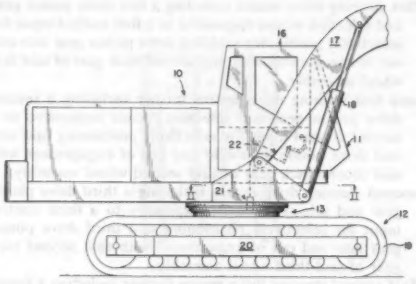
means attaching the base member to the faucet to prevent relative movement therebetween whereby an empty container can be placed on the platform in the first position to move the lever and cause the faucet to dispense fluid into the container and when the container is full, the platform and container will move to the second position and shut off the flow of fluid from the faucet.

3,972,378

SWING LOCK MEANS FOR AN HYDRAULIC EXCAVATOR

Gerard P. A. J. Houriez, Gerpinnes, and Charles M. G. Van Wuytswinkfl, Thimeon, both of Belgium, assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 23, 1975, Ser. No. 543,572
Int. Cl.² B62D *27/06*
U.S. Cl. 180—6.58 **15 Claims**



1. An earthworking vehicle comprising

a mobile undercarriage,

an upper unit rotatably mounted on said undercarriage,

an operator's cab mounted on said upper unit,

a swing gear drive mechanism operatively connected between said upper unit and said undercarriage for selectively rotating said upper unit,

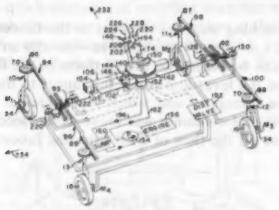
lock means operatively connectable between said upper unit and said undercarriage for selectively locking said upper unit against rotation relative to said undercarriage, said lock means disposed within the confines of said swing gear drive mechanism, and

operator control means mounted in said operator's cab and operatively connected to said lock means for selectively locking said upper unit to said undercarriage, said operator control means comprising a handle movably mounted on a support in said operator's cab and guide means formed on said support for guiding said handle between locked and unlocked positions thereof, said handle being operatively connected to said lock means by a bellcrank pivotally mounted on said support and having one arm thereof pivotally connected to said handle and a cable interconnected between a second arm of said bellcrank and said lock means.

3,972,379
HYDROSTATICALLY DRIVEN VEHICLE

Charlie L. Norris, P.O. Box 263, Grove Hill, Ala. 36451

Filed Mar. 11, 1975, Ser. No. 557,334
Int. Cl.² B62D 17/34
U.S. Cl. 180—46 5 Claims



1. A rectangular configured automotive vehicle comprising:

first, second, third and fourth corner-positioned wheel assemblies, each assembly including an independently driven wheel motor and wheel driven by said motor, and further including means for rotating and positioning a said wheel assembly in azimuth, including a first pinion gear and rack drive coupling means including a first rack gear coupled to and driving said first pinion gear and a second rack gear attached to said first rack gear and adapted to be driven;

first steering drive means including a first drive pinion gear and selection means responsive to a first control input for selectively positioning said first drive pinion gear into and out of engagement with said second rack gear of said first wheel assembly;

said first steering drive means further including a second drive pinion gear and selection means responsive to a second control input for selectively positioning said second drive pinion gear into and out of engagement with said second rack gear of said second wheel assembly;

second steering drive means including a third drive pinion gear and selection means responsive to a third control input for selectively positioning said third drive pinion gear into and out of engagement with said second rack gear of said third wheel assembly;

Said second steering drive means further including a fourth drive pinion gear and selection means responsive to a fourth control input for selectively positioning said fourth drive pinion gear into and out of engagement with said second rack gear of said fourth wheel assembly; and

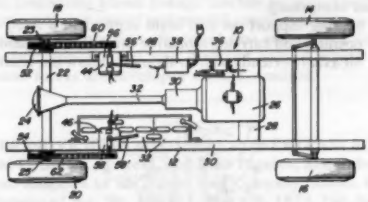
control means for providing all four of said inputs or two of said inputs to two selected said selection means for selectively positioning drive pinion gears into engagement with second rack gears of adjacent said wheel assemblies, the adjacent wheel assemblies being wheel assemblies on one side of said vehicle.

3,972,380
VEHICLE WITH REGENERATIVE POWER SYSTEM

Perley N. Hudson, 816 Phillip Parker Road, and William R. Toby, 609 Comal, both of Fort Worth, Tex. 76108

Filed Apr. 11, 1975, Ser. No. 567,176
Int. Cl.² B60K 1/00
U.S. Cl. 180—65 R 4 Claims

1. In combination, a vehicle including a frame having a plurality of ground engageable wheel means, an electric motor having a rotatable output shaft, rotating drive train means drivingly connecting said output shaft to said wheel means, a bank of rechargeable storage batteries supported from said frame, a pair of electric current generators including rotatable input shafts, drive means drivingly connecting said wheel means to said input shafts, and parallel first and second circuits electrically connecting said generators to said storage batteries and said batteries to said motor, respectively, said second circuit including voltage control means electrically connected therein for selectively controlling the voltage of

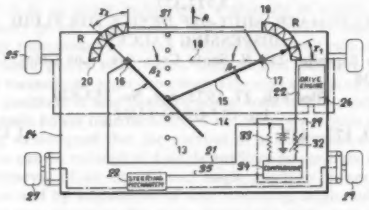


current flow from said batteries to said motor, said drive means including a pair of two speed ratio transmissions each selectively driving a corresponding input shaft at a selected drive ratio of two available drive ratios.

3,972,381
SENSOR ARRANGEMENT FOR HARVESTER OF STALK-TYPE ROW CROP

Josef Gail, Aichach-Unterwittelsbach, Germany, assignor to Maschinenfabrik Fahr Aktiengesellschaft, Gottmadingen, Germany

Filed July 17, 1975, Ser. No. 596,918
Claims priority, application Germany, July 17, 1974, 2434396
Int. Cl.² B62D 5/04
U.S. Cl. 180—79.1 6 Claims



1. In a row stalk crop harvester having a chassis displaceable along the ground in a transport direction determined by a steering mechanism itself operated by an automatic controller, the improvement comprising:

a pair of sensor arms pivotal on said chassis about pivot axes fixed thereon and spaced apart thereon transverse to said direction;

means for pivotally biasing each of said arms into a normal position extending toward the axis of the other arm, whereby forward displacement of said chassis in said direction with a row between said axes deflects said arms backwardly by engagement of said crop with said arms;

generator means connected to each of said arms and having an impedance varying with the extent of deflection of the respective arm backwardly by said crop from said normal position, the impedance of one of said generator means increasing on such backward deflection of the respective arm and the impedance of the other arm decreasing on backward deflection of the respective arm; and

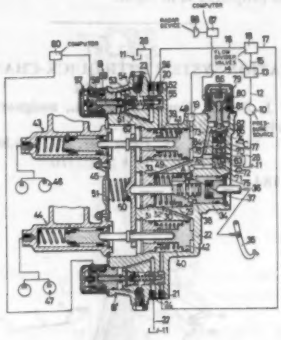
means for connecting said generator means in series and to said controller for feeding to same an input indicating lateral position of said row relative to said chassis.

3,972,382

HYDRAULIC BRAKE SYSTEM WITH AUTOMATIC BRAKE MEANS FOR VEHICLES

Katsuki Takayama, Chirya, and Yoshiharu Adachi, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Toyota, Japan

Filed Apr. 14, 1975, Ser. No. 567,855
Claims priority, application Japan, May 24, 1974, 49-59155
Int. Cl.² B60K *28/00;* B60T *7/12*
U.S. Cl. 180—98 7 Claims



1. In a hydraulic brake system for vehicles with means for automatically applying brakes in response to a signal and including a brake foot pedal, master cylinder means, wheel cylinder means, a computer for generating an electrical output signal, a fluid pressure source, a reservoir, a fluid passage fluidically connecting said fluid pressure source to said reservoir, a valve piston disposed in said fluid passage and movable to restrict said fluid passage in response to movement of said brake foot pedal, power piston means operatively connected to said master cylinder means, and power chamber means fluidically communicated with said fluid passage, hydraulic pressure in said power chamber means being increased due to restriction of said fluid passage thereby urging said power piston means to move in a direction wherein hydraulic pressure in said master cylinder means is increased;

the improvement comprising an automatic brake valve means disposed in said fluid passage and electrically connected to said computer, said automatic brake valve means being actuated by said electrical output signal to restrict said fluid passage whereby hydraulic pressure in said power chamber means is increased so as to move said power piston means in the said direction.

3,972,383

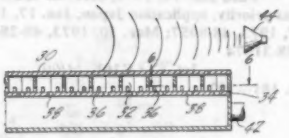
SOUND ABSORPTION WITH VARIABLE ACOUSTIC RESISTANCE MEANS BY OSCILLATORY AIR PRESSURE SIGNAL

Gary Warner Green, Enfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 481,003, June 19, 1974, abandoned. This application Aug. 1, 1975, Ser. No. 601,565
Int. Cl.² E04B *1/99*
U.S. Cl. 181—33 HC 6 Claims

1. A system for varying the acoustic resistance of an acoustical lining disposed in a duct of an air propulsor subject to changing sound level and grazing airflow conditions in said duct comprising:

a nonlinear sound suppression liner having a porous facing sheet and a substantially close-ended side and bottom enclosure member defining a cavity and having an open top surface, said facing sheet extending over said top surface and a plurality of sidewalls extending between said facing sheet and said enclosure member in said cavity to divide said cavity into a plurality of cells; and



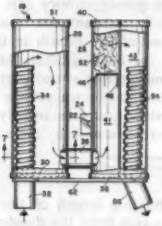
means adjacent said facing sheet for impinging an oscillatory pressure signal of 100–160 dB at an inaudible frequency on said facing sheet to vary the acoustic resistance thereof to a maximum for a selected sound level and airflow condition in the duct.

3,972,384

SPARK ARRESTING MUFFLER

Wallace E. Hoefs, Imperial Beach, Calif., assignor to Ralph Electric Plants, Inc., Chula Vista, Calif.

Filed Apr. 17, 1975, Ser. No. 568,843
Int. Cl.² F01N *3/06*
U.S. Cl. 181—36 C 9 Claims



1. For use on an exhaust outlet of a device producing hot exhaust gases, a muffling device for the suppression of hot particulates from exhausting to the atmosphere comprising:

an arresting chamber,

a partition dividing said arresting chamber into at least two compartments, said partition extending longitudinally in said arresting chamber to substantially extend the course of the exhaust gases within the arresting chamber by forcing the gases to traverse the length of one compartment and then the other compartment, thereby cooling the gases before exhausting to the atmosphere,

said partition is apertured in a region distal from the point of entry of exhaust gases into said chamber,

a multiplicity of closely spaced fibers in said chamber on one side of said partition, packed adjacent said apertures for filtering the exhaust gases to remove particulates therefrom,

and the filtered exhaust gases first passing through said one compartment, then through said fibers, through said apertures and through said other compartment prior to being directed to the atmosphere from said other compartment.

7. The muffling device of claim 6, further comprising:

a tubular member in said muffling chamber for directing exhaust gases into said muffling chamber.

3,972,385

HORN SPEAKER

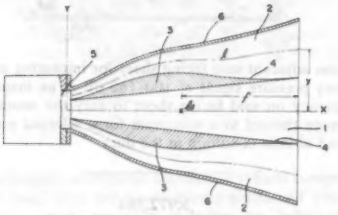
Masanori Hino, Hirakata; Taro Eguchi, Osaka, and Chitoshi Shiraga, Shimane, all of Japan, assignors to Onkyo Kabushiki Kaisha, Japan

Filed Jan. 14, 1974, Ser. No. 432,879

Claims priority, application Japan, Jan. 17, 1973, 48-8056; Jan. 17, 1973, 48-8057; Mar. 10, 1973, 48-28438; Mar. 19, 1973, 48-31574

Int. Cl.² G10K 11/00

U.S. Cl. 181—192 4 Claims



1. A horn speaker comprising a diaphragm and a side wall and at least one interior sound partition, forming at least two passages for radiating sound waves emitted from the diaphragm, the horn speaker having a substantially straight principal horn axis and a generally planar mouth surface positioned substantially in parallel to the inlet face of the horn, the area of each sound passage in section taken along a plane perpendicular to the principal horn axis increasing continuously at a substantially constant rate of area expansion from a throat to the plane of the mouth in the direction of the principal horn axis, the horn speaker being characterized in that said at least one interior sound partition has inner and outer surfaces, at least said outer surface being curved along the principal horn axis to give substantially the relationship for each sound passage represented by the equation:

$$l = -f + \sqrt{(lo + f)^2 + y^2}$$

wherein l is the effective length of the sound passage for propagating sound waves from the diaphragm to a point at a distance of y from the intersection of the principal horn axis with the mouth plane, the point being positioned on at least one first straight directional line contained in the mouth plane and passing through the intersection, lo is the length of the principal horn axis and f is a virtual focal distance.

3,972,386

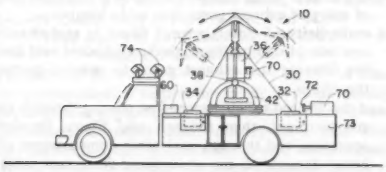
RESCUE APPARATUS

Raymond W. E. Hayslip, Milton, Fla., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Dec. 23, 1975, Ser. No. 643,782

Int. Cl.² A62B 1/18

U.S. Cl. 182—50 9 Claims



1. Rescue apparatus comprising projectile means and launcher means for launching said projectile, one end of said projectile having a grappling hook means projecting therefrom, the opposite end of said projectile having fin means for stabilizing said projectile in flight, pulley means mounted on said projectile intermediate the ends thereof, first rope storage means and second rope storage means for paying out rope to said projectile while in flight, rope means secured in and leading from said first storage means over said pulley into and secured to said second storage means, the length of said rope being at least twice the distance to be traversed by said projectile, said first and second rope storage means being separate for a distance sufficient to keep said rope away from said fins when said projectile is in flight.

3,972,387

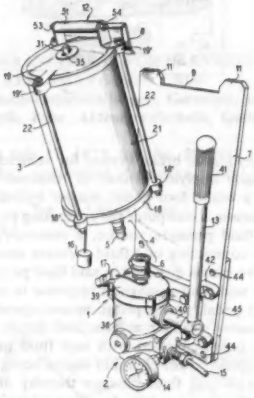
LUBRICATION SYSTEM WITH QUICK-CHANGE SUPPLY RESERVOIR

Fredrick J. Braun, Canonsburg, Pa., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Nov. 25, 1974, Ser. No. 526,802

Int. Cl.² F16N 3/10

U.S. Cl. 184—28 7 Claims

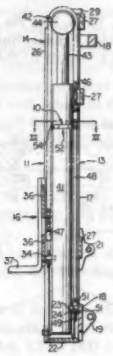


1. In a reservoir-type pump structure for liquid and viscous materials, particularly lubricating materials such as lubricating oils and greases, the combination of a pump structure having an inlet port, and an outlet port at which material may be discharged, a removable supply reservoir adapted to contain, under pressure, material to be pumped, said reservoir comprising a container providing a chamber closed at both ends, a piston reciprocably movable in said chamber, means for applying force to said piston continuously urging the latter toward one end portion of the chamber to provide a predetermined pressure preloading of material contained therein, such end portion having a material discharge port therein, and a spring-urged slidable locking sleeve coupling of the self-sealing, quick-change type comprising a pair of cooperable mating coupling members each including valve means, which valve means respectively unseat each other when mated and seat themselves when separated from one another, one of said coupling members being operatively connected to the pump structure at said inlet port, said valve means thereof forming a closure member therefor when separated from its mating member, and the other coupling member being connected to the supply reservoir at said discharge port, said valve means thereof forming a closure member therefor when separated from its mating member, said coupling members, when mated, operatively unseating said valve means and directly connecting said reservoir with said pump structure, whereby material at said predetermined pressure may be supplied thereto.

3,972,388
LIFT TRUCK MAST ASSEMBLY WITH A RESILIENT CHAIN POSITIONER

Milford D. McVeen, Highland Heights, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Aug. 4, 1975, Ser. No. 601,779
Int. Cl.² B66B 9/20
U.S. Cl. 187—9 E **6 Claims**



1. In a mast and carriage assembly for a lift truck of the type having a stationary mast section fixed to the truck, a movable inner mast section reciprocable within the stationary mast, a fork carriage movably associated with the inner mast section, a hydraulic jack having an extensible and retractable rod, means operatively connected to the rod for moving the inner mast section relative to the stationary mast section and having a sheave rotatably mounted thereon, a flexible chain trained over the sheave and having one end attached to the fork carriage, and an elongated chain rod having one end attached to the other end of the chain and its other end loosely anchored to the stationary mast wherein the improvement comprises;

a bracket attached to the hydraulic jack at its upper end; and

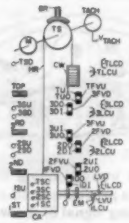
a resilient link having one end fastened to the bracket and its other end fastened to the chain rod for normally positioning the end of the chain rod relative to the jack while permitting restrained limited relative movement therebetween.

3,972,389
ELEVATOR STOP CONTROL ARRANGEMENT

John Joseph Faup, Oradell, N.J., assignor to Otis Elevator Company, New York, N.Y.

Filed Sept. 23, 1974, Ser. No. 508,121
Int. Cl.² B66B 1/36
U.S. Cl. 187—29 R **8 Claims**

1. Apparatus for the control of an elevator car which accelerates in accordance with prescribed pattern, said apparatus generating signals to initiate stopping sequences for the car and including, position responsive means operating in response to the location of the car at that predetermined distance from a landing at which a stopping operation is to be initiated when the car is traveling at its rated speed in order for it to decelerate in a desired manner to a stop at said landing; call registering means operable to register calls for service for said landing; a stopping switch operating in response to the operation of said position responsive means and to the existence of the registration of a call for said landing when said car is traveling at said rated speed to initiate a stopping operation to decelerate said car in said desired manner to a stop at said landing; and delay means operating on those trips in which the car is traveling at less than its rated speed when it arrives at said predetermined distance from said landing sensing the arrival of the car at said predetermined distance from said

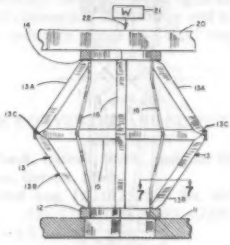


landing while traveling at less than said rated speed and operating to enable said stopping switch to initiate a stopping operation in response to a call for said landing registered after said car approaches closer to said landing than said predetermined distance.

3,972,390
ENERGY ABSORBING DEVICE

Donald F. Melton, Minneapolis, and Karl E. Neumeier, Stillwater, both of Minn., assignors to Programmed & Remote Systems Corporation, St. Paul, Minn.

Filed Mar. 5, 1975, Ser. No. 555,448
Int. Cl.² F16F 7/12
U.S. Cl. 188—1 C **12 Claims**



1. An energy absorbing device for absorbing kinetic energy from a moving load moving in direction toward a support comprising a plurality of individual bending members arranged at spaced locations to define a bounded space, said bending members having first ends adapted to be supported on a fixed support and second ends adapted for receiving a load tending to compress said bending members, said bending members having portions which separate under compression so that the distance between said portions increases, and a band encircling said bending members adjacent said portions and elastically yielding under tension to absorb energy as said bending members bend and said portions separate.

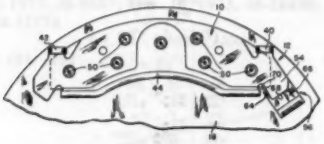
3,972,391
LINING WEAR SENSOR

John R. Penn, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Mar. 20, 1975, Ser. No. 560,267
Int. Cl.² F16D 66/02
U.S. Cl. 188—1 A **7 Claims**

1. In a friction pad for engagement with a disc brake rotor, said friction pad including a substantially flat backing plate having a pair of corresponding edges and a wearable lining secured to a portion of said backing plate, said lining having

a working surface for engagement with said rotor, a worn lining indicator secured to said backing plate, said worn lining indicator including a base and a vibratable reed projecting from said base toward said rotor when the base is secured to the backing plate, said reed terminating short of the initial



working surface of the unworn lining so that said reed will engage said rotor upon a predetermined amount of lining wear to give an audible warning signal of the worn condition of said lining, and detent means carried by said base and cooperating with said corresponding edges of said backing plate to orient said reed with respect to the rotor.

3,972,392

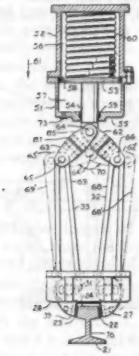
FAIL-SAFE CLAMPING APPARATUS

Norman Allen Johnson, 5325 Tenth Ave., South Delta, British Columbia, Canada

Filed Apr. 7, 1975, Ser. No. 565,482

Int. Cl.[2] B61H 7/12

U.S. Cl. 188—43 **3 Claims**



1. A clamping apparatus in combination with a clamped member having a lateral surface and opposing sides, a frame means in opposed relation to said lateral surface and adapted for primary movement parallel to said clamped member and secondary movement substantially perpendicular to said opposing sides, lateral guide end-brackets secured to said frame means in opposed relation to said lateral surface and having slotted holes on faces substantially perpendicular to said lateral surface, a pair of lever pin means operatively mounted through a pair of yoke means and said lever pin means being slidably mounted in said slotted holes, a pair of clamp levers each pivotally mounted substantially at one end between said yoke means on one of said lever pin means, each clamp lever having a clamping surface means in opposed relation to one of said opposing sides, each said yoke means including a guide member on each side of said clamped member behind which said clamping surface means retracts, a pair of actuating links, a linear actuator operatively mounted in said frame means with its actuating axis substantially perpendicular to said lateral surface, each of said actuating links pivotally interconnected at one end to the other end of one of said clamp levers, the other ends of said actuating links pivotally interconnected to said linear actuator means, whereby actuation of said linear actuator impels said clamping surface means against said opposing sides of said clamped member and slidable movement of said yoke means with respect to said lateral guide end-brackets compensates for said secondary movement of said frame means.

3,972,393

FRICTION PAD AND SUPPORT FOR A DISC BRAKE

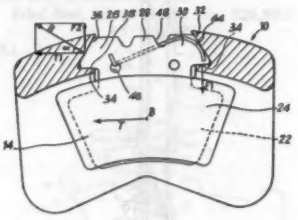
Pierre Courbet, Villiers-le-Bel, and Claude Le Marchand, Domont, both of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Oct. 29, 1974, Ser. No. 518,648

Claims priority, application France, Nov. 8, 1973, 73.39685

Int. Cl.[2] F16D 65/04

U.S. Cl. 188—73.3 **4 Claims**



1. In combination, a friction pad, for a disc brake having a rotor, and a torque member with torque-receiving surfaces for absorbing braking torque generated by engagement of said friction pad with said rotor, said friction pad comprising a backing plate and friction material secured to a portion of said backing plate, said backing plate including a generally T-shaped extension, said extension defining base and transverse portions, said base portion projecting from the portion of the backing plate covered by the friction material, said transverse portion extending from the base portion, each end of said transverse portion terminating in carrying and anchoring edges, said friction pad and torque member being constructed and arranged so that said friction pad generates a tangential braking force and a tilting torque tending to tip said friction pad when said friction pad is urged into braking engagement with said rotor, each of said carrying edges being substantially parallel to the theoretical line of application of said tangential braking force, each of said anchoring edges defining an acute angle with respect to their corresponding carrying edges, said tangential braking force and a portion of the force generated by said tilting torque being transmitted through a corresponding one of said anchoring edges to a corresponding torque-receiving surface on said torque member when the rotor is rotating in a given direction, the remainder of the force generated by said tilting torque being transmitted through the carrying edge associated with the other of said anchoring edges to the corresponding torque-receiving surface on said torque member.

3,972,394

FRICTION MATERIAL

Michael George Jacko, Southfield, Mich., and Bruce William Klein, South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed Sept. 8, 1975, Ser. No. 611,291

Int. Cl.[2] F16D 69/02

U.S. Cl. 188—73.1 **4 Claims**

1. An organic friction lining pad for use with a copper rotor in a braking system having a composition consisting of:

10–15 percent by weight of phenolic resin;

25–45 percent by weight of asbestos fiber;

10–15 percent by weight of an organic friction modifier selected from a group consisting of rubber scrap, latex, molasses and asphaltic base materials;

3–12 percent by weight of a carbonaceous material selected from a group consisting of graphite and carbon;

15–30 percent by weight of an inorganic friction modifier selected from a group consisting of barytes, whiting, talc and rottenstone;

3–7 percent by weight of an abrasive particle selected from a group consisting of silica, magnesium oxide, zircon, mullite, and alumina; and

7–15 percent by weight of iron powder particles, said phenolic resin being cured to form a binder for retaining said asbestos fiber, organic friction modifiers, inorganic friction modifiers, carbonaceous materials, abrasive particles, and iron powder particles in a fixed relationship to provide said pad with inherent thermal energy absorption capabilities aligned with said copper rotor and maintain a substantially uniform coefficient of friction up to 550°F.

3,972,395

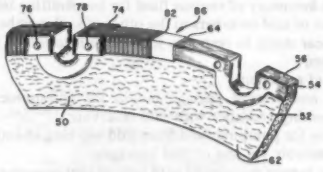
OXIDATION INHIBITING CAPS FOR CARBON FRICTION DISC

Norman E. Jannasch, and Norris A. Hooton, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Continuation-in-part of Ser. No. 456,323, March 29, 1974, abandoned. This application Sept. 29, 1975, Ser. No. 617,543

Int. Cl.² F16D *69/02*

U.S. Cl. 188—251 A **15 Claims**



1. In a wheel and brake assembly having key-slot coupling means through which a braking torque is transmitted during frictional engagement of a plurality of carbon friction disc, said carbon friction disc having a peripheral surface subjected to an oxidizing environment as a result of the development of said frictional engagement, the improvement comprising:

sheath means covering said periphery for preventing degradation of said carbon friction disc by oxygen, said sheath means having a coefficient of expansion substantially equal to said carbon friction disc to avoid the introduction of adverse stresses which could occur during exposure to the thermal operating range developed by said frictional engagement;

first binder means located between said sheath means and said periphery for providing a carbon bond therebetween to extend the structural unity of the carbon friction disc to the sheath means;

keeper means adjacent the sheath means for preventing any external member from abrading the sheath means sufficiently to allow degradation of said carbon friction disc;

pin means extending through said sheath means and said carbon friction disc for reducing the possibility of fractionalization of said carbon bond during repetitive applications of said braking torque; and

said keeper means including a screen means connected to said pin means and covering said sheath means for holding said sheath means against said periphery if said carbon bond should have broken because of said repetitive application of braking torque.

3,972,396

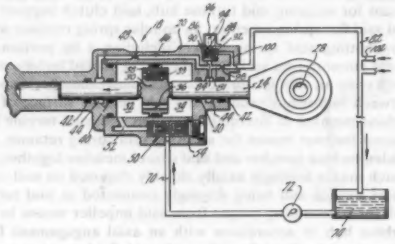
LEAKAGE DETECTOR WITH BACK PRESSURE SENSOR

Gregory Bochnak, New Hall, Calif., assignor to United Technologies Corporation, Hartford, Conn.

Filed June 5, 1975, Ser. No. 584,237

Int. Cl.² F16F *9/20*

U.S. Cl. 188—312 **6 Claims**



1. A hydraulic damper for controlling lag-lead movements of a helicopter rotor blade comprising a cylinder, a piston reciprocable in said cylinder having a piston rod extended through an end wall of said cylinder, primary and secondary seals in said end wall surrounding and engaging said rod, a cavity about said rod between said seals, a fluid leakage line extending from said cavity having a fixed restriction therein, a leakage indicator including a chamber communicating with said leakage line upstream of said restriction and a fluid responsive member in said chamber, and an unobstructed pressure equalization line having a fluid connection at one of its ends to said leakage line downstream from said restriction and having a fluid connection at its other end to the chamber of said leakage indicator above the fluid responsive member therein.

3,972,397

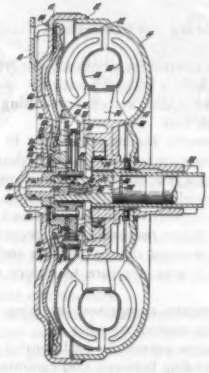
TORQUE CONVERTER AND SLIPPING CLUTCH ASSEMBLY

Forrest R. Cheek, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 11, 1975, Ser. No. 603,319

Int. Cl.² F16D *39/00*, *47/06*

U.S. Cl. 192—3.3 **2 Claims**



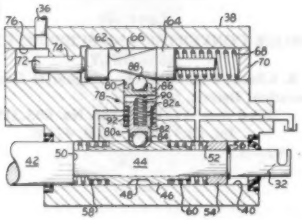
1. A torque converter and clutch comprising; impeller means, a stator, a turbine in toroidal fluid flow relation with

said impeller means and stator and including a turbine hub having fluid passage means formed therethrough and a splined inner diameter adapted to be drivingly connected to an output shaft, a clutch support hub having a smooth outer cylindrical surface, a flat spring disposed between said turbine hub and said clutch support hub having a plurality of radially extending spring fingers, one of said fingers being disposed in close proximity to one end of said fluid passage means, first fastener means for securing said turbine hub, said clutch support hub and said flat spring together, an annular spring retainer member abutting said spring fingers including a lip portion disposed circumjacent said spring fingers, a bladed turbine member having an annular surface, and a spacer member disposed between said spring retainer and said annular surface of said turbine member in interdigital relation with said turbine hub, second fastener means for securing said spring retainer, said bladed turbine member and said spacer member together; and clutch means sealingly axially slidably disposed on said cylindrical surface and being drivingly connected to said turbine hub for transmitting torque from said impeller means to said turbine hub in accordance with an axial engagement force determined by fluid flow through said fluid passage means, said turbine member being movable against said flat spring in response to the speed differential between said impeller and turbine to move said one spring finger relative to said one end of said fluid passage means whereby fluid flow through said fluid passage means is controlled to control the axial engagement force of said clutch means.

3,972,398
PARKING BRAKE AND TRANSMISSION VALVE INTERLOCK

Richard W. Chamberlain, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 17, 1975, Ser. No. 568,952
Int. Cl.² F16H *57/10*
U.S. Cl. 192—4 A **9 Claims**

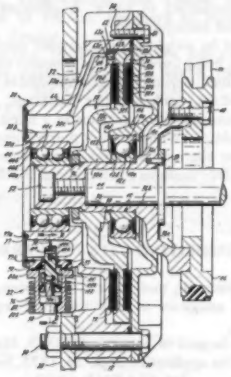


1. A parking brake and transmission interlock system comprising:
- a transmission control member movable from a first composition to at least a second position;
- a parking brake release system comprising a source of pressurized fluid; and
- pressure-responsive means responsive to a failure of said source of pressure to maintain a predetermined pressure for imposing a resistance to the movement of said transmission control member from said first position,
- said pressure-responsive means comprises pressure-responsive detent means responsive to a decrease in said source pressure to increase detent pressure and responsive to an increase in source pressure to reduce said detent pressure,
- said detent means comprises camming means mounted adjacent said control member,
- depression means carried by said control member, and
- a plunger extending between said camming means and said control member for engagement with said depression when said control member is in said first position and said pressure fails.

3,972,399
TEMPERATURE RESPONSIVE COUPLING

Warren G. Bopp, Farmington, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 29, 1974, Ser. No. 528,187
Int. Cl.² F16D *35/00, 43/25*
U.S. Cl. 192—58 B **18 Claims**



1. A viscous fluid coupling comprising:
- first and second relatively rotatable members mounted about a common axis;
- a working chamber defined by said members and containing an inventory of viscous fluid for transmitting torque from one of said members to the other of said members by fluid shear stress in response to relative rotation of said members;
- a fluid reservoir;
- first and second passage means for communicating said working chamber with said reservoir;
- means for pumping fluid from said working chamber to said reservoir via one of said passages;
- valve means associated with one of said passages and movable between a first position blocking fluid flow in one of said passages and a second position allowing fluid flow in said one passage; and
- temperature sensing means mounted on one of said members at a position radially disposed with respect to said common axis and including means containing a liquid-solid phase change substance having a high coefficient of expansion during phase change and operative to move said valve means between said first and second positions in response to said phase change occurring over a predetermined temperature range.

3,972,400
FRICTION DISC FOR CLUTCHES AND THE LIKE

Norman B. Howells, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 9, 1974, Ser. No. 495,996
Int. Cl.² F16D *13/60*
U.S. Cl. 192—107 R **10 Claims**

1. An improved friction disc for clutches and the like, comprising a (circumferentially uninterrupted) plate member formed in a substantially flat annular configuration having a (circumferentially uninterrupted) friction facing on a side thereof, and a plurality of straight angular grooves formed in said facing adapted to carry cooling fluid therein, each of said angular grooves being angularly disposed at an identical angle of from about 100° to about 120° relative to a radius of said disc intersecting an inlet end of such groove, a plurality of radially disposed grooves formed in said facing and disposed

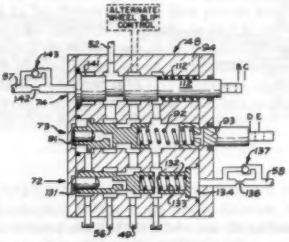
circumferentially thereabout, the number of radial grooves is equal to the number of angular grooves and wherein each of

said radial grooves is disposed between each pair of circumferentially adjacent angular grooves.

3,972,401
SLIPPING CLUTCH CONTROLS RESPONSIVE TO WHEEL SLIP

Sidney J. Audiffred, Washington; David W. Bump; Raymond N. Erkkila, both of Morton; Lowell E. Johnson, and Shairyl I. Pearce, both of East Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 382,717, July 26, 1973, Pat. No. 3,896,910. This application July 11, 1974, Ser. No. 487,487
Int. Cl.² F16D *25/00*
U.S. Cl. 192—109 F **5 Claims**

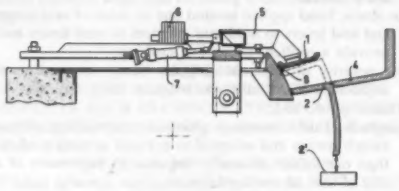


1. A hydraulic control system for a power train, the power train proportioning power from a prime mover to auxiliary equipment and a primary output shaft, the power train including an input means coupling the prime mover with the auxiliary equipment, an output means operatively coupled with the primary output shaft and a slipping clutch means providing a variable coupling between the input and output means, comprising adjustable valve means for hydraulically regulating engagement pressure of the slipping clutch means, manual control means coupled with the valve means for adjustment thereof and slip indicating means comprising resilient abutment means engaged by said manual control means only after it has moved a predetermined distance for providing a feedback signal when a selected level of torque is being transferred through the slipping clutch means, the abutment means including means for resisting operation of the manual control means after it has moved said predetermined distance to indicate the selected level of torque transfer and manually adjustable means separate from said manual control means for varying the position of said abutment means and thereby varying the clutch engagement pressure and the selected level of torque transfer.

3,972,402
DEVICE FOR BRAKING ROLLED STOCK

Walter Johann Karlberger, Smedjebacken, Sweden, assignor to Morgardshammar Aktiebolag, Smedjebacken, Sweden

Filed Feb. 19, 1975, Ser. No. 551,058
Claims priority, application Sweden, Feb. 19, 1974, 7402164
Int. Cl.² B65G *13/00*
U.S. Cl. 193—35 A **4 Claims**

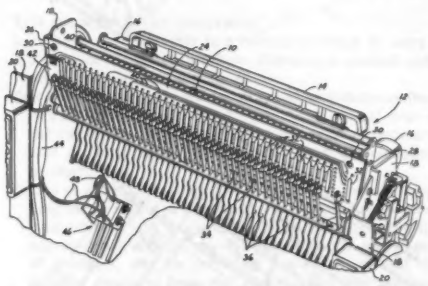


1. A device for braking rolled stock on a delivery table having a plurality of spaced rollers for receiving said stock, said device comprising brake plates located between respective rollers and movable to a position above the rollers to at least in part support the stock thereon, a plurality of brake flaps, means for supporting said brake flaps for movement into position above said brake plates, said brake flaps having a surface engageable with said rolled stock while said rolled stock is supported on said brake plates to apply a braking force thereto, and means for effecting adjustment of the braking force applied to said stock by said brake plates and brake flaps.

3,972,403
DECODING MEANS FOR USE WITH A TYPEWRITER

Cyle Van Alstine, 834 Briar Hill Drive, Island Lake, Ill. 60042, and William E. Webb, 1126 Algonquin Road, Schaumburg, Ill. 60172

Filed Sept. 5, 1974, Ser. No. 503,271
Int. Cl.² B41J *5/30*
U.S. Cl. 197—19 **14 Claims**



1. Apparatus for attachment to a typewriter for selectively actuating a plurality of electrical switch means in response to depressing the keys of a typewriter, comprising, in combination:

support means for attachment to the underside of a typewriter generally beneath the keyboard thereof, said support means being adapted to support a plurality of switch means adjacent one another;

a plurality of magnetically actuated switch means positioned adjacent one another and extending along said support means generally across the width of the keyboard;

a plurality of pivotable actuating levers positioned adjacent said switch means, each of said levers being operably

associated with a key of said typewriter and with one of said switch means so that pivotal movement of one of said actuating levers occurs in response to depression of its associated typewriter key and a portion of said lever is pivoted into close proximity to the associated switch means;

a magnet secured to said portion of said actuating lever that is moved into close proximity to said switch means, said magnet actuating said switch means when in close proximity thereto;

an elastic band applied around one or more of said magnets and said levers to hold said magnets on said levers and to provide a resilient protective cushion;

the polarity of adjacent magnets being reversed so that adjacent ends of adjacent magnets have opposite magnetic poles; and,

magnetic shield means positioned intermediate adjacent switch means and adapted to prevent actuation of more than one switch means in response to depression of any one of said typewriter keys.

3,972,404

TYPEWRITER SHIFT MECHANISM

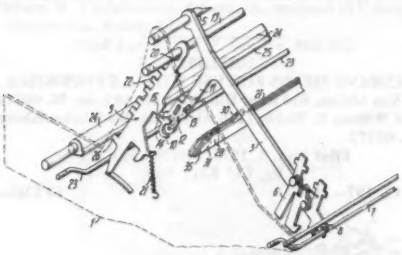
Ulrich Menzi, Yverdon, and Raymond Clavel, Oulens, both of Switzerland, assignors to Hermes Precisa International S.A., Yverdon, Switzerland

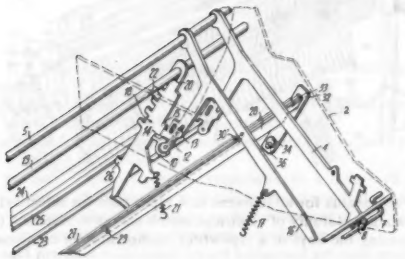
Filed Oct. 3, 1974, Ser. No. 511,931

Claims priority, application Switzerland, Oct. 12, 1973, 14514/73

Int. Cl.² B41J 25/24

U.S. Cl. 197—71 **3 Claims**





1. In a typewriter including a shift mechanism, a frame having opposite side walls, a carriage and a type head mounted on the carriage, a first interposer for the upper case letters, a second interposer for the lower case letters, means connected to the side walls of said frame for mounting said interposers, said interposers including means for transmitting shift commands to said carriage, one interposer being in an active position when the other one is in an inactive position, a first shift lever controlling the first interposer, a second shift lever controlling the second interposer, means connected to the side walls of said frame for mounting said shift levers, drive means for moving said interposers to an active position, each of said shift levers including means for moving the corresponding interposer when said levers are moved from an inactive to an active position and cause said interposer to cooperate with said drive means, the improvement comprising a balance member including a beam with first and second ends, means on said frame side walls for mounting said balance member with the first and second ends of said beam adjacent said first and second levers, said balance member including means for pivotally mounting said beam thereon whereby when one of said levers is moved to an active position it engages the related end of said beam, causing it to pivot and move the other end of said beam against the other of said levers, causing the other of said levers to move into an inactive position, and means on one of said frame side walls acting on one end of said beam to adjust the position of the axis of said beam with respect to said first and second shift levers.

3,972,405

RELOADING DEVICE

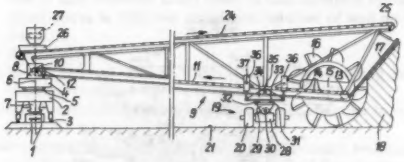
Raimonds Sukurs, Rheinhausen, and Hans Kemper, Rheydt-Odenkirchen, both of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed June 19, 1974, Ser. No. 480,885

Claims priority, application Germany, June 22, 1973, 2331631

Int. Cl.² B65G 65/16

U.S. Cl. 198—9 **3 Claims**



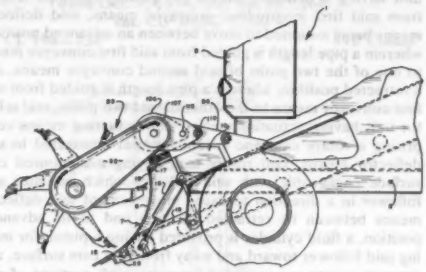
1. A reloading device which includes in combination: a belt bridge having a longitudinal direction, pick-up means supported by said belt bridge for picking up pourable material from a dump, a storage place conveyor, a transfer device movable over said storage place conveyor, said belt bridge resting on said transfer device, joint means whereby said belt bridge is pivotable relative to said transfer device about a vertical axis and about an axis transverse to the longitudinal direction of said bridge, carriage means supporting said belt bridge, first rocker means interposed between said carriage means and said belt bridge for supporting said belt bridge on said carriage means and pivotally connected about a transverse axis to said belt bridge, supporting rail means attached to said first rocker means mounted on said belt bridge and extending in the longitudinal direction of said belt bridge, roller means upon which said supporting rail means rest, second rocker means supporting said roller means and pivotally connected to said carriage means on a transverse axis, and means for angularly adjusting said supporting rail means relative to said belt bridge at such variable inclinations relative to the longitudinal direction of said belt bridge that the reaction force component acting approximately in the longitudinal direction of said belt bridge and originating in said pick-up means may be at least partially transferred to said carriage means.

3,972,406

WINDROW LOADER

Raymore D. MacDonald, Eureka, Ill., assignor to Rivinius, Inc., Eureka, Ill.

Filed Jan. 28, 1975, Ser. No. 544,755
Int. Cl.[2] B65G 65/20
U.S. Cl. 198—9 5 Claims



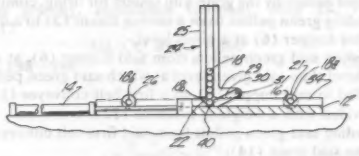
1. In a windrow loader wherein a rotary feeder is carried by a frame and projects forwardly thereof, the improvement comprising a pair of elongated box members spaced from and parallel to one another, pivotally mounted on said frame on a pivot axis perpendicular to the long direction of said box members, said box members projecting forwardly from said frame, a fixed torque tube carried by and extending between said box members at an end thereof near said frame but displaced from said pivot axis, a shaft revolvably journaled within said fixed torque tube and extending between and into the confines of said box members, the axis of rotation of said shaft being wholly displaced from the pivot axis of said box members; first power train means mounted on said shaft for rotation therewith; outer shaft means rotatably journaled in each of said box members; second power train means operatively connected to be driven by said first power train means and mounted within said box members on and to drive said outer shaft means; a rotating cross torque tube connected to said outer shaft means to be driven therewith, said cross torque tube extending between said box members, and feed means mounted on said cross torque tube, said box members enclosing said first and second power train means.

3,972,407

TRANSFER MECHANISM FOR ROUND PARTS

Anthony Kushigian, 9 Pine Lake Drive, Etowah, N.C. 28729

Filed Feb. 3, 1975, Ser. No. 546,684
Int. Cl.[2] B65G 47/00, 25/08
U.S. Cl. 198—20 R 16 Claims



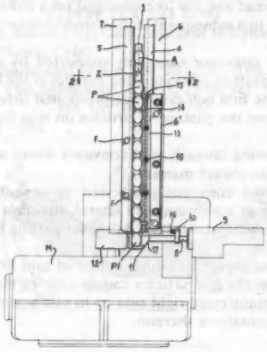
1. A transfer mechanism for moving parts between first and second locations comprising a slide mounted for reciprocal movement in a first plane between first and second positions, first part receiving means on said slide to receive a first part from said first location when said slide is in said first position, actuating means for moving said slide in a first direction in said first plane from said first position to said second position and in an opposite direction in said first plane from said second position to said first position, said receiving means being at said first location when said slide is in its first position and at said second location when said slide is in its second position, and one-way gate means mounted adjacent said second location for allowing said first part in said receiving means to pass to said second location when said slide is moving in said first direction and, when said slide is moving in said opposite direction, for blocking movement of said first part in said receiving means back to said first location and, in response to movement of said part toward said first location, for causing said first part to move in a direction transverse to said first plane out of said receiving means so that said part remains at said second location when said receiving means returns to said first location.

3,972,408

DEVICE FOR ALIGNING DELICATE OBLONG PRODUCTS, SUCH AS CHOCOLATES, ON A CONVEYOR

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Italy

Filed Nov. 8, 1974, Ser. No. 522,298
Claims priority, application Italy, Nov. 21, 1973, 3530/73
Int. Cl.[2] B65G 47/22
U.S. Cl. 198—29 5 Claims



1. A conveyor device comprising;

a conveyor belt movable in a certain direction to carry a stream of elongated products disposed in general axial alignment with said direction;

first and second guide tracks, disposed at a distance from one another, respectively along first and second sides of the conveyor belt, for maintaining said general alignment, said distance being slightly wider than the elongated products;

means at a downstream end of the conveyor belt for stopping the products to cause a row of the products in endwise contact with one another to accumulate while the conveyor belt slidingly moves below the accumulated row of products, and for removing successive ones of the stopped products from the accumulated row adjacent said end, transversely of said direction;

a movable structure for accurately aligning the products with said direction, in synchronism with the removing thereof, said structure being located opposite one of the guide tracks and extending from adjacent said end in an upstream direction along the accumulated row of products; and

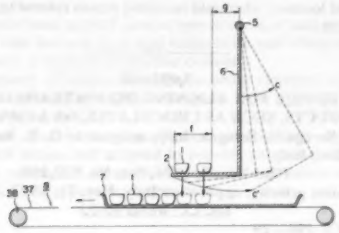
a pusher secured to the means for removing successive products, the pusher including a support and a pusher bolt adjustably threadedly secured to the support for pushing the movable structure partly across said distance against the accumulated products, to shift the accumulated products toward said one guide track and for adjusting the moving of the movable structure.

3,972,409

TRANSFER DEVICE AND METHOD

Torahiko Hayashi, 3-4, Nozawa, Ytsunomiya, Tochigi, Japan

Filed Oct. 25, 1974, Ser. No. 518,210
Claims priority, application Japan, Oct. 25, 1973, 48-120330
Int. Cl.² B65G 47/26
U.S. Cl. 198—31 AC 3 Claims



1. Apparatus for transferring formed articles such as confectionery, bread and the like arranged on a conveyor in one or more lines to a subsequent station simultaneously, comprising

a first belt conveyor swingably supported by at least one fulcrum shaft axially extending parallel to the longitudinal axis of the first belt conveyor positioned thereabove and offset from the passage of articles on said first belt conveyor,

means to swing laterally said conveyor about said fulcrum shaft in an abrupt manner,

and a second conveyor positioned underneath said first conveyor in a substantially lateral direction adapted to convey containers such as article supporting surfaces and containers,

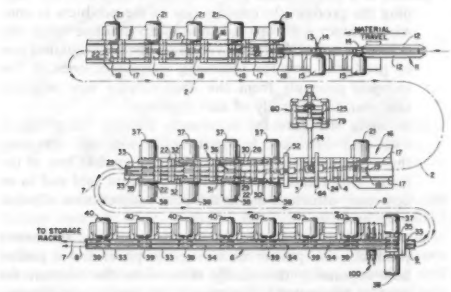
whereby the abrupt receding motion of said first conveyor from beneath said articles causes articles thereon to be directly transferred right side up to said second conveyor or said containers thereon.

3,972,410

APPARATUS FOR DIVERTING PIPE TO A PLURALITY OF BEDS OR THE LIKE

Ralph M. Shaffer, Allison Park, and Jerzy F. Patejak, Wampum, both of Pa., assignors to Aetna-Standard Engineering Company, Ellwood City, Pa.

Filed Dec. 2, 1974, Ser. No. 528,711
Int. Cl.² B65G 47/26
U.S. Cl. 198—31 AC 13 Claims



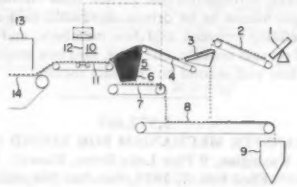
1. In combination in a pipe mill of the character described having means for delivering successive pipe lengths, first longitudinal conveyor means receiving said pipe lengths in tandem in a single row with the leading end of one pipe length spaced from the trailing end of the preceding pipe length, second longitudinal conveyor means providing two separate longitudinal pipe conveying paths, each adapted to carry pipe lengths, a pair of cooling beds adjacent said two paths, each bed having a transverse conveyor for receiving pipe lengths from one path of said second conveyor means, and a selector unit having a deflector means for guiding the pipe lengths from said first longitudinal conveyor means, said deflector means being mounted to move between an advanced position, wherein a pipe length is guided from said first conveyor means to one of the two paths of said second conveyor means, and a retracted position, wherein a pipe length is guided from said first conveyor means to the other of said two paths, said selector unit having actuating means, said actuating means comprising a rotary cam and a cam follower connected to said deflector means, said rotary cam having a contoured cam surface engageable with said follower which actuates said follower in a direction to cause movement of said deflector means between its retracted position and to its advanced position, a fluid cylinder is provided having a piston for moving said follower toward and away from said cam surface, and separate means are provided for moving all portions of said rotary cam in said last named direction.

3,972,411

METHOD OF FEEDING GREEN PELLETS ONTO GRATE OF PRETREATMENT FURNACE IN THE PRODUCTION OF REDUCED PELLETS

Kazuharu Yatsunami; Satoru Miyakado; Katsuaki Shiohara; Tsuneo Kataoka, all of Fukuyama, and Akira Honda, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1975, Ser. No. 548,526
Claims priority, application Japan, Feb. 27, 1974, 49-22367
Int. Cl.² G01G 11/08
U.S. Cl. 198—37 16 Claims



1. A method of feeding green pellets onto a travelling grate (14) of a pretreatment furnace (13) in the production of reduced pellets by the grate-kiln system for firing, comprising:

feeding green pellets from a sieving means (3) to a distributor hopper (6) at a given level;

feeding said green pellets from said hopper (6), at a lower level than said given level at which said green pellets are fed to said hopper (6), to a first belt conveyor (11) provided with a weighing machine (12);

feeding said green pellets from said first belt conveyor (11) to said grate (14);

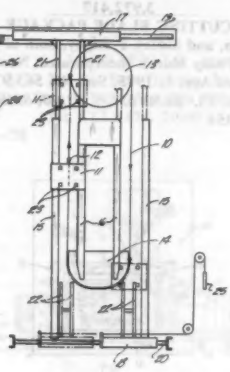
continuously measuring, by means of said weighing machine (12), the weight of said green pellets fed onto said first belt conveyor (11) while said green pellets are on said first belt conveyor (11);

discharging green pellets from a bottom outlet of said hopper (6), which bottom outlet is located at a level below said lower level which said green pellets are fed to said first belt conveyor (11), onto a second belt conveyor means (7) which is located below said bottom outlet of said hopper; and

varying the operating speed of said second belt conveyor means (7) as a function of said measured value to main-

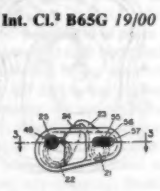
tain a substantially constant supply of said green pellets to said grate (14).

3,972,412
VERTICAL CONVEYOR
Richard Henkel, 4037 Center Ave., Lyons, Ill. 60534
Filed Oct. 9, 1974, Ser. No. 513,264
Int. Cl.² B65G *15/00*
U.S. Cl. 198—138 10 Claims



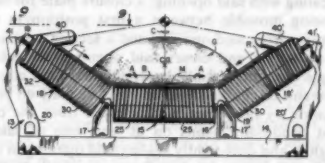
1. In a vertical conveyor, the combination comprising
an endless element movable in a closed vertical path,
at least one load carrier suspended pivotally about a transverse axis on said conveyor element and movable in a first vertical path and a second vertical path through an intermediate curved path,
guide rails along the vertical paths for guiding the carrier,
a fixed track extending generally horizontally adjacent the curved path and a slide mounted on said track for generally horizontal movement between said vertical paths,
and interengaging means between the carrier and the slide for guiding the carrier and maintaining it in vertical position during movement through the arcuate path between said vertical paths.

3,972,413
CHAIN CONVEYOR FOR PRINTING PRESSES
Claus Simeth, Offenbach, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany
Filed May 20, 1975, Ser. No. 579,192
Claims priority, application Germany, May 22, 1974, 23424917
Int. Cl.² B65G *19/00*
U.S. Cl. 198—180 5 Claims



1. In a conveyor for a printing press, the combination comprising a pair of roller chains formed of overlapping links held together by regularly spaced pins, means for guiding the roller chains in spaced-apart parallel relation about an endless path including straight and curved portions with the corresponding pins in the two chains being retained in respective alinement with one another, a plurality of gripper frames extending bridgingly between the chains, said gripper frames each including first and second parallel cross bars carrying grippers and pads respectively and including mounting members at the ends of the crossbars for mounting the same on the respective chains, the dimension of the mounting members being such that the mounting members span a plurality of links of chain, a pair of adjacent pedestals arranged opposite each of the mounting members the pedestals of each pair being secured to the inside surface of one of the chains and spaced in the direction of chain movement, a mounting pin arranged transversely between each pedestal and the associated mounting member, each of the mounting pins in the pair having a registering opening, one of the mounting pins of the pair being snugly fitted in its opening for lateral captivity in all directions while providing relative rocking movement, the other mounting pin of the pin having an opening which provides limited freedom of lateral movement in the direction of chain movement to accommodate the change in center-to-center distance which occurs as the chains move between the straight and curved portions of their path.

3,972,414
SELF-CENTERING IDLER ROLLERS FOR TROUGHING CONVEYER BELTING
Rene Conrad, Foster City, Calif., assignor to Dynaloc Corporation, San Mateo, Calif.
Continuation-in-part of Ser. No. 282,331, Aug. 21, 1972, abandoned. This application June 3, 1974, Ser. No. 475,667
Int. Cl.² B65G *15/62*
U.S. Cl. 198—202 15 Claims



1. In a troughing conveyor of the type having an endless belt trained over a drive roller and a return roller, and a plurality of idler roller units interspersed therebetween, each of said idler roller units including a roller supporting frame, a horizontally journaled medial roller, and a pair of upwardly slanted side rollers disposed one at each end of the medial roller for supporting the side portions of the belt in slanted, trough forming disposition; an improved idler roller unit for self-centering the belt relative to the rollers and for counteracting the tendency of the belt to climb one slanted side roller due to the weight of an off-centered load on the opposite side thereof, comprising in combination:
a medial roller having a pair of spirally tending, belt engaging ribs with each rib tending outwardly from the center of the roller for spreading a central portion of the belt engaged thereby widthwise; and
a pair of slanted side rollers disposed one at each end of said medial roller with the inside end of each side roller being located immediately adjacent an end of said medial roller and the outside end of each side roller being elevated relative to said medial roller, each of said side rollers having an outwardly tending, spiralled, belt engaging rib on the inner, lower-most disposed half of the length thereof for urging the slanted side portion of the belt engaged thereby outwardly and upwardly, and each of said side rollers having an inwardly tending, spiralled, belt-engaging rib on the outer, upper-most disposed half of the length thereof for urging the slanted side portion of the belt engaged thereby inwardly and downwardly to counteract any tendency of the belt to move off-center due to the effects of an off-centered load.

3,972,415

DRAG-CHAIN CONVEYOR CONSTRUCTION

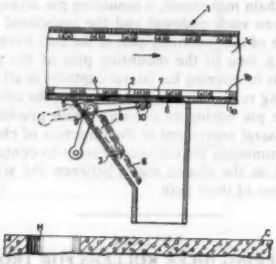
Wolfgang Rohde, Essen, Germany, assignor to Bergwerksverband GmbH, Essen, Germany

Filed Aug. 6, 1974, Ser. No. 494,953

Claims priority, application Germany, Aug. 8, 1973, 7328985[U]

Int. Cl.[2] B65G 15/60

U.S. Cl. 198—205 7 Claims



1. In a drag-chain conveyor, particularly of the type used in conveying coal in pre-heated condition, a combination comprising wall means defining an elongated passage having a bottom wall formed with an opening which is bounded by a circumferentially extending marginal wall portion of stepped cross-section having an annular contact face; a discharge chute extending downwardly from said bottom wall and communicating with said opening; a closure plate for said opening and being movable between a first position in which it is withdrawn from said opening and a second position in which it is located in and closes said opening, said closure plate having a circumferentially extending bevelled edge face, said wall means, discharge chute and closure plate all being subject to heating by heat energy transferred from the coal in preheated condition; means on at least one of said faces for gas-tightly and dust-tightly sealing said opening in said bottom wall of said passage, said sealing means including elastically-yielding, heat-resisting strip means located intermediate said faces and effective for making at least line contact engagement between the latter when said closure plate is in said second position; and mounting means mounting said closure plate for movement between said first and second positions.

3,972,416

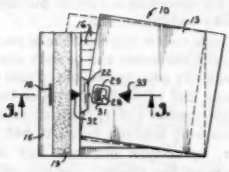
SAFETY MATCHBOOK WITH LATCHING MEANS

Ralph E. Underwood, 11820 Washington, Kansas City, Mo. 64114

Filed Aug. 4, 1975, Ser. No. 601,591

Int. Cl.[2] A24F 27/12

U.S. Cl. 206—106 8 Claims



1. In a matchbook having first and second flap members adapted to overlap one another to close the matchbook, the combination therewith of:

a ridge connected to said first flap member to project therefrom;

means defining an opening in said ridge; and

a projection connected to said second flap member and adapted to engagingly interlock with said ridge to latch said first and second flap members in overlapping relation, said projection being laterally offset from said opening but alignable therewith upon lateral flexing of one of said flap members, said projection being of a size to pass through said opening into and out of interlocking engagement with said ridge.

3,972,417

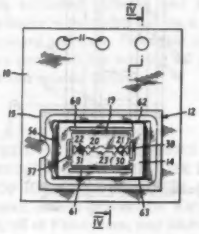
CUTTING BLADE PACKAGE

Clemens A. Iten, and Sidney J. Rigby, both of Staunton, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Apr. 1, 1975, Ser. No. 563,971

Int. Cl.[2] B65D 65/16, 83/10, 85/62

U.S. Cl. 206—354 11 Claims



1. A cutting blade package comprising a tray having an indented elongated pocket with a bottom wall and an outer open face, spaced posts extending upwardly from the said bottom wall, a blade threaded over said posts, one or more of said posts having a laterally extending flexible detent lug under which the blade is engaged arranged and adapted to form means for releasably holding the blade on the posts, and a supporting card secured to the tray over said open face, said card having a panel over said open face displaceable for access to the blade.

3,972,418

MOLDED SUTURE PACKAGE

Michael Schuler, Piscataway, and Eberhard H. Thyen, Middlesex, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Nov. 25, 1974, Ser. No. 526,551

Int. Cl.[2] A61L 17/02

U.S. Cl. 206—63.3 16 Claims

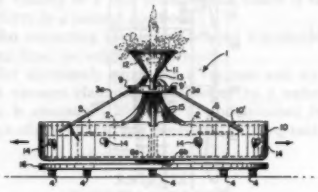
1. In a package for armed sutures comprising a laminate of a first molded sheet and a second cover sheet, said molded sheet defining an elongated suture channel terminating at one end in an enlarged needle chamber, said channel and said chamber having a bottom and side walls, said bottom being displaced from the normal plane of the molded sheet and said side walls extending from said bottom to said normal plane of the molded sheet, said channel and said chamber being open

to one side of the molded sheet, said cover sheet being flat and sealed to said molded sheet along the open side of said channel and said chamber to close said channel and said chamber and form a closed suture channel terminating at one end in a closed needle chamber, the improvement comprising locating the needle chamber centrally of the package, extending the suture channel in a path circumscribing said needle chamber, and precutting the cover sheet along a line intermediate the needle chamber and adjacent convolutions of the suture channel whereby a portion of the cover sheet is adapted to be opened to provide access to the needle chamber.

3,972,419
FOOD SERVER

Junius Short, 3132 2nd St., New Orleans, La. 70125

Filed Dec. 9, 1974, Ser. No. 530,832
Int. Cl.² A47G *29/00*
U.S. Cl. 211—78 **12 Claims**



12. A rotatable food server of the lazy-Susan type comprising:

a circular basic body having a bottom, a central post emanating vertically therefrom and a series of radial, vertical walls emanating from said central post and terminating in a circular, vertical, peripheral wall, thereby defining a series of triangularly shaped, confined openings for containing and holding food inserts, at least two opposed radial walls including projecting support ledges along a substantial length thereof near their tops;

a multiple number of triangularly shaped insert means for holding food for insertion in said openings, the length of said insert means being substantially less than the length of said radial walls, leaving a space between the inner tip of said insert means and said central post, whereby said insert means can be easily grasped for the removal or the insertion of the inserts from and into said basic body; at least one of said triangularly-shaped insert means being in the form of a platform which is supportable by said ledges;

an upper utensil holder located near the top of said central post;

a set of utensils each having a wider dimension at its operative end supported in radial, inclined array about said central post and being held in place by notches located in said peripheral wall of said body and in said upper utensil holder, said utensils being supported at an incline of approximately 45° and being supported directly over aid radius walls, leaving the spaces over said confined openings completely open, and said upper utensil holder comprising a circular container means having a peripheral wall in which said utensil notches are located and a bottom for catching any drippings from the operative ends of said utensils when supported by said holder;

a circular inverted-cone-shaped container for flowers, mints or the like positioned at the top of said central post above said circular utensil holder;

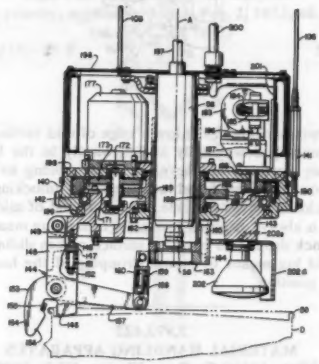
a series of knob means projecting horizontally out from said peripheral wall of said basic body disposed about the complete circumference of wall for grasping and rotatably turning said basic body and its contents about said base; and

a base upon which said body is rotatably mounted on its upper side and having on its lower side a set of uni-directonal wheels permitting movement only back and forth laterally in a straight line.

3,972,420
CRANE APPARATUS

Arthur J. Stock, Lakewood; Donald E. Christofer, Willowick, and Joseph E. Brinza, Euclid, all of Ohio, assignors to Stock Equipment Company, Cleveland, Ohio

Division of Ser. No. 182,088, Sept. 20, 1971, Pat. No. 3,835,617. This application Oct. 25, 1973, Ser. No. 409,750
Int. Cl.² B66C *17/06*
U.S. Cl. 212—14 **32 Claims**



11. Crane apparatus comprising a trolley; means for supporting said trolley for transverse movement to a variety of predetermined locations; means for moving said trolley to said predetermined locations, grab means for holding an object to be lifted, hoist means on said trolley for raising and lowering said grab means in an essentially fixed essentially vertical path relative to said trolley, television camera means carried by said grab means and directed downwardly to view the object to be lifted by said grab means, and television monitor means located at a fixed control location remote relative to said trolley for viewing the scene viewed by said television camera means to determine when the grab means is properly located to pick up said object.

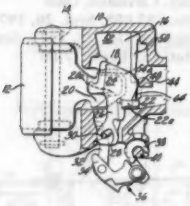
3,972,421
CAR COUPLER

Kenneth L. DePenti, Mayfield Heights, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Apr. 18, 1975, Ser. No. 569,444
Int. Cl.² B61G *3/06*
U.S. Cl. 213—127 **1 Claim**

1. In a standard E car coupler a head having a lock receiving chamber, said head having a guard arm on one side thereof and knuckle pivoted to the other side thereof, said knuckle being movable from closed to open position, a lock in said chamber comprising an upper body portion, said lock having a locking position relative to said knuckle to hold the latter in closed position and being movable upwardly in said chamber to unlocking position relative to the knuckle, said lock being adapted to drop by gravity from said unlocking position to said locking position when said knuckle is swung to closed position, a vertically extending guide rib in said chamber disposed on the knuckle side of said head, said lock body portion having on one side thereof at its upper end a laterally extending lug the rear surface of which is adapted to engage said rib to guide the lock and limit rearward tilting thereof during down-

ward movement of the latter toward said locking position, lug means in said head on the guard arm side thereof extending laterally into said chamber and disposed directly rearward of said lock body portion when the lock is in said locking position, said lock body portion having a vertical rear surface adapted to engage said lug means to limit rearward displacement of the lock when in said locking position, and said lock body portion having a bevelled rear surface of substantial



length commencing at the lower edge of said vertical surface and extending downwardly and forwardly to the bottom of said body portion, said bevelled surface being so arranged that, upon dropping of said lock from said unlocking position during closing of the knuckle, the lower end of said bevelled surface is always disposed forwardly of said lug means so that as the lock drops said bevelled surface makes sliding contact with said lug means to permit dropping of the lock to said locking position.

3,972,422

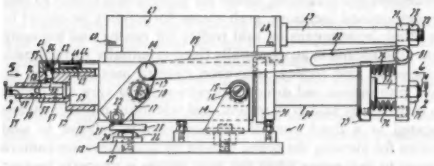
MATERIAL HANDLING APPARATUS

George Mink, 13130 Geoffrey, Warren, Mich. 48093

Filed Sept. 16, 1974, Ser. No. 506,113

Int. Cl.² B25J *3/00*

U.S. Cl. 214—1 BB **8 Claims**



1. A material handling apparatus for moving workpieces or the like between a first location and a second location, gripping means, supporting means supporting said gripping means for movement between a gripping position in which a workpiece is gripped and a released position, said supporting means being movable to position said gripping means in said first location and in a second location, single drive means including an element movable between a first position and a second position, means including a lost motion connection operably connecting said drive means element to said supporting means for moving said gripping means between said first location and said second location in response to movement of said drive means element, said lost motion connection being effective to permit movement of said drive means element from a position intermediate its first position and its second position to its first position when said gripping means remains in its first location, actuating means responsive to the movement of said drive means element from its intermediate position to its first position relative to said gripping means for moving said gripping means from one of its positions to the other of its positions, locking means for retaining said gripping means in its other position upon movement of said gripping means from its first location to its second location, and means responsive to the movement of said gripping means to its second location for releasing said locking means and permitting said actuating means to move said gripping means from its other position to its one position.

3,972,423

APPARATUS FOR HANDLING COVERSLIPS

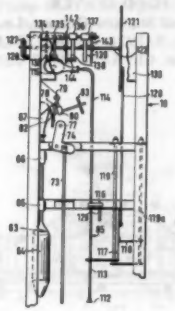
Peter William Tipton, Reading, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

Filed Aug. 1, 1974, Ser. No. 493,592

Claims priority, application United Kingdom, Aug. 16, 1973, 38702/73

Int. Cl.² B65G *61/00*

U.S. Cl. 214—1 BT **2 Claims**



1. In an apparatus for preparing specimen-containing slides for viewing under a microscope by placing a mounting medium over the specimen and a coverslip over the mounting medium, the improvement for transfering a coverslip from a first location to a second location comprising:

A. A rigid supporting frame;

B. A compressible bulb fixedly connected to said frame;

C. Flexible tubing connected to said bulb;

D. A rigid pipe connected to said tubing;

E. A suction pad connected to said pipe;

F. Reciprocating means to raise and lower said pipe and said suction pad in a linear path from a first position in contact with said coverslip to a second position in contact with said slide; and

G. First compression means supported from said frame and adapted to compress said bulb just prior to contact of said suction pad with said coverslip, and to remove compression while said suction pad and said coverslip are engaged thereby retaining said coverslip in contact with said suction pad.

3,972,424

AUTOMATIC WAFER LOADING AND PRE-ALIGNMENT SYSTEM

Kenneth Levy, Saratoga; David Corbin, Sunnyvale; Alan J. Fleming, Santa Clara, all of Calif.; David Friedman, Framingham; Gilbert G. Fryklund, Winchester, both of Mass.; Vance Parker, San Jose, and Gerd Schliemann, Sunnyvale, both of Calif., assignors to The Computervision Corporation, Bedford, Mass.

Division of Ser. No. 340,281, March 12, 1973, Pat. No. 3,902,615. This application Aug. 14, 1975, Ser. No. 604,805

Int. Cl.² B65G *47/24*

U.S. Cl. 214—1 Q **7 Claims**

1. A pre-alignment system for initially aligning on a chuck, a generally circular integrated circuit wafer having a flat edge portion, said pre-alignment system comprising:

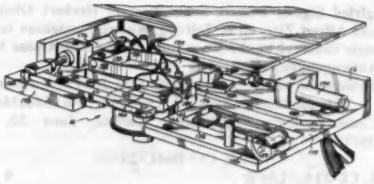
a wafer chuck having means for vacuum clamping a wafer to the chuck surface;

a pivotally mounted bearing arm having two rotatable mounted rollers located at one end of the arm for engage-

ment with the wafer edge in a first position and retracted therefrom in a second position;

means for moving said bearing arm between said first and second positions to engage and retract said rollers from the edge of said wafer;

a spring loaded wafer flat-identifier means having a flat surface which is urged against the wafer edge under



spring loading in a first position and which is retracted thereform in a second position;

means for retracting said spring loaded flat-identifier flat surface from the edge of said wafer;

means for alternately supplying a vacuum and air to said chuck vacuum clamping means whereby a wafer in said chuck is alternately clamped to and released from the surface of said chuck; and, means for rotating said chuck.

3,972,425

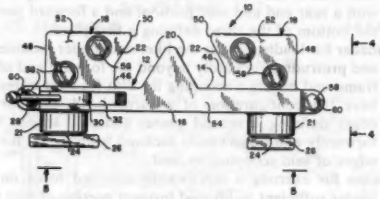
TANDEM MIDLOCK

John M. Di Martino, 72 Lumur Drive, Sayville, N.Y. 11782

Filed June 5, 1974, Ser. No. 476,379

Int. Cl.² B65G 1/14

U.S. Cl. 214—10.5 R **7 Claims**



1. A combined horizontal and vertical connector for stackable containers, said containers of the type having an I.S.O. standard corner fitting at each of the corners thereof, said corner fitting having orifices in the outer surfaces thereof, said orifices opening into an inner recess in said fitting, said connector comprising:

means for defining a planar base member having a longitudinal axis;

a pair of individual manually operable twist locks, one of each being located at opposite ends of said planar base member, and depending from said planar base member along the longitudinal axis of said base member;

a pair of post means, one of each being located at opposite ends of said planar base member extending upward from said planar base member along the longitudinal axis of said base member, each of said post means having an inclined surface on the interior transverse side thereof substantially angled toward each other and each forming an acute angle with said planar base member; and,

ridge means arising from said planar member located intermediate said post means, said ridge means having a ramp surface facing the inclined surface of each of said post means and being in substantially parallel alignment therewith, said ramp surface and said post means being sized and spaced apart sufficiently for guiding up to two upper situated containers into adjacently lockable engagement with said base member as a corner fitting of a one of said containers is lowered into flush contact with said base member while entrapping a portion of said corner fitting within the space between a said ramp means and a said inclined surface of a said post means, said post means penetrating into a said inner recess through a one of said orifices.

3,972,426

DEVICE FOR CHARGING MATERIALS INTO BLAST FURNACE

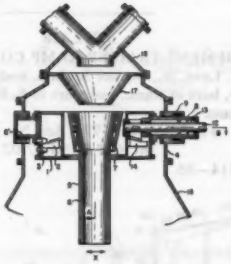
Kanjyo Tachiyama, Kure, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1974, Ser. No. 438,558

Claims priority, application Japan, Feb. 2, 1973, 48-13546

Int. Cl. C21b 7/00

U.S. Cl. 214—35 R **5 Claims**



1. A device for charging materials into a blast furnace comprising a casing, a gear box positioned within the casing, a chute positioned within the gear box, a first pair of shafts fixed to said gear box for supporting the latter in the casing for rotatable movement about the axis of said shafts, a second pair of shafts carried by the gear box and positioned perpendicularly to the axis of the first pair of shafts, said chute supported by the second pair of shafts, a ring gear rotatably mounted in the gear box, a pinion carried by one of the shafts of said second pair and meshing with the ring gear, means for mounting one of said shafts of said first pair and said gear box for rotation to swing the chute in one direction, a drive shaft rotatably carried by the gear box, said drive shaft carrying a pinion meshing with the ring gear, and means for mounting the drive shaft for rotation to rotate the last-named pinion, the ring gear and the first-named pinion to swing the chute in a direction perpendicular to said one direction.

3,972,427

APPENDANT ELEVATABLE LOADER FOR VEHICLES

Charles R. Stanley, Bellevue, and Russell I. Tillman, Auburn, both of Wash., assignors to The Boeing Company, Seattle, Wash.

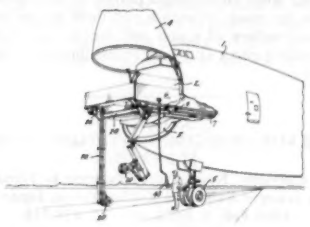
Filed Sept. 25, 1974, Ser. No. 509,239

Int. Cl.² B64C 1/22

U.S. Cl. 214—38 BA **11 Claims**

1. An appendant loader for loading and unloading cargo space of a vehicle through an upright opening in a wall of the vehicle comprising a substantially horizontal frame adjacent to the upright vehicle opening, load-hoisting means carried by said frame and raisable relative to said frame substantially vertically upward from a position below said frame to lift a load upward sufficiently for substantially horizontal movement thereof through the upright wall opening into the cargo space, guide means carried by the vehicle and guiding said frame with said load-hoisting means carried thereby for edgewise substantially horizontal movement through the upright wall opening into and out of the cargo space, and supporting

means independent of the vehicle and said guide means engageable with the ground and providing support for the portion of said frame exteriorly of the upright vehicle wall opening during movement of the frame through such opening.

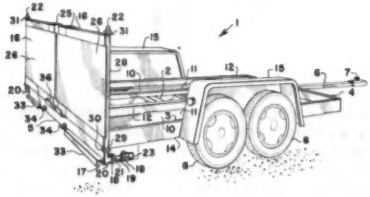


3,972,428

EQUIPMENT TRAILER RAMP CONSTRUCTION

Joseph W. Love, Jr., Bonner Springs, and Daryl B. Fife, Kansas City, both of Kans., assignors to B. H. Mfg., Inc., Kansas City, Kans.

Filed Dec. 26, 1974, Ser. No. 536,454
Int. Cl.² B65G *67/02*
U.S. Cl. 214—85 **3 Claims**



1. A trailer apparatus comprising:

a. a trailer frame having a rear end member and a side member forming a bed corner,

b. a ramp positioned adjacent said rear end member and having first and second ends,

c. means mounting said ramp on said trailer frame for pivotal movement in two directions, said ramp mounting means comprising an L-shaped arm having one arm portion pivotally mounted on said side member for movement about an axis extending generally along said side member and the other arm portion pivotally engaged with one of said ramp ends,

d. stop means cooperating with said one arm portion fixing same against rearward longitudinal movement,

e. said ramp being pivotally moveable between a ramp forming position and a second position extending transversely across the trailer frame adjacent the rear end thereof for forming a tailgate,

f. retaining means cooperating with said ramp for releasably retaining same in said tailgate forming position,

g. support means secured to said trailer frame and projecting from said rear end, said support means engaging a portion of said ramp adjacent said one end when same is in said ramp forming position,

h. said ramp being a plurality each being mounted on said trailer frame for pivotal movement and having the other ends thereof in closely spaced relation when said ramps are in said tailgate forming position,

i. said retaining means including upstanding stops secured to said trailer frame in longitudinally spaced relation and receiving portions of said ramps therebetween when the ramps are in the tailgate forming position for preventing forward and rearward movement,

j. an opening through a portion of each of said ramps, said openings being in alignment when said ramps are in said tailgate forming position, and

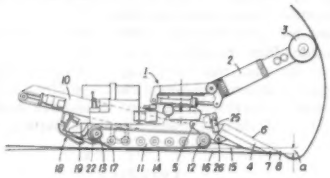
k. a key receivable through said openings preventing pivoting movement of said first arm portions.

3,972,429

DIVIDING CUTTING MACHINE

Siegfried Sigott; Hubert Schwelberger; Herbert Obermaier, and Alfred Zitz, all of Zeltweg, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Austria

Continuation of Ser. No. 374,388, June 28, 1973, abandoned.
This application June 12, 1975, Ser. No. 586,344
Claims priority, application Austria, June 30, 1972, 5639/72
Int. Cl.² B66C *23/00*
U.S. Cl. 214—130 R **9 Claims**



1. A dividing cutting machine comprising:

a frame having a forward end,

crawler track means mounted with said frame for carrying said frame, said crawler track means including a tread with a rear end and rear portion, and a forward portion, the bottom of the tread defining a first plane,

a loader for loading ore or the like, said loader mounted on and protruding forwardly beyond the forward end of said frame and having a scooping lip with forward edges that have the configuration of an arrowhead, said forward edges defining a second plane, and said loader being forwardly and downwardly inclined toward said forward edges of said scooping lip, and

means for exerting a downwardly directed force on said loader sufficient to lift said forward portion of said tread from a first position wherein said second plane is generally an extension of said first plane and said forward portion of said tread touches the ground, to a second position wherein said second plane is tangent to said tread in said rear portion thereof, said forward portion of said tread being spaced above said second plane and the ground, so that said machine may move along the ground while said scoop is in its second position so that it is not necessary to stop and lift the scoop during advancement of said machine.

3,972,430

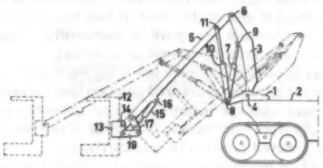
CRANE JIB ARRANGEMENT

Erik Torsten Forslund, Alfta, Sweden, assignor to Ostbergs Fabriks AB, Alfta, Sweden

Filed Oct. 10, 1973, Ser. No. 404,897
Claims priority, application Sweden, Oct. 13, 1972, 13227/72
Int. Cl.² B66C *1/68*
U.S. Cl. 214—147 G **1 Claim**

1. A crane jib arrangement with a base arm pivoted in a support and a jib lever pivotally connected thereto, defining a lower and an upper bearing point, respectively, of the base arm, which jib lever in its free end supports a working tool such as a tree harvesting device, a first hydraulic jack being placed between a lower point longitudinally displaced relative

to the journal place of the base arm and an upper point on the base arm, and a second hydraulic jack being placed between a lower point which is the same as the lower point for the first jack and an upper point on the jib lever, said second hydraulic jack having, on one hand, its line of action extending approximately parallel with a line through the bearing points on the base arm, and on the other hand, its said lower point placed at a lower level than the bearing point of the base arm, the improvement wherein the upper bearing point of said base



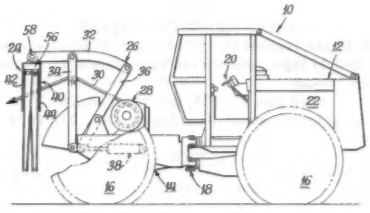
arm is positioned at a higher level than is the said upper point of said second hydraulic jack, so that when said second hydraulic jack is locked in a substantially extended position at an effective length substantially equal to the effective length of said base arm, said second hydraulic jack has a lifting effect on the jib lever at its free end as a consequence of the retracting action of the first hydraulic jack, limiting thereby the vertical motion of the free end of the jib lever in a relatively narrow horizontal plane.

3,972,431

GRAPPLE UNIT FOR LOGGING VEHICLES

Robert Louis Fischer, New Lenox, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 24, 1975, Ser. No. 552,381
Int. Cl.² B66C 1/32
U.S. Cl. 214—147 G **4 Claims**



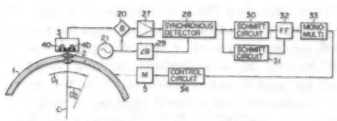
1. A logging machine comprising
a vehicle,
arch means movably arranged on one end of the vehicle, and
a grapple unit supported by the arch means, the grapple unit including
a structural plate assembly having a pair of plates secured together in spaced apart relation to form an enclosed region therebetween, the structural plate assembly being secured to the arch means on one side while forming a gripping edge on a generally opposite side,
a pair of grapple arms extending outwardly from the enclosed region of the structural plate assembly adjacent the gripping edge,
a single motor means arranged within the enclosed region of the plate assembly and in protected relationship between the plates thereof, and
means interconnecting the motor means with the two grapple arms and pivotably anchoring the motor mean-s and grapple arms on the structural plate assembly so that operation of the motor means causes the grapple arms to open away from each other and to close toward each other and toward the gripping edge to secure logs and the like of varying sizes.

3,972,432

METHOD FOR ROTATIONALLY POSITIONING A WELDED STEEL PIPE IN RESPONSE TO A SEAM SECTION THEREOF AND AN APPARATUS FOR POSITIONING THE SAME

Toshihiro Mori, Yokohama; Katsujiro Watanabe, Tokyo, and Akihiko Nishisaka, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 19, 1975, Ser. No. 550,958
Claims priority, application Japan, Feb. 21, 1974, 49-20750
Int. Cl.² B65G 7/00
U.S. Cl. 214—340 **7 Claims**



1. A method for rotationally positioning a welded steel pipe in response to a seam section thereof comprising disposing two electromagnetic sensitive impedance elements in a manner approaching said welded steel pipe and spaced from each other circumferentially of said welded steel pipe so that the distance between said two impedance elements is substantially equal to the width of said seam section of said welded steel pipe, rotating said welded steel pipe to obtain a detecting signal which, when said both sensitive impedance elements have been brought into coincidence with said seam section of said welded pipe, becomes a reference potential the polarity of said detecting signal being thereafter inverted with respect to said reference potential, and stopping the rotation of said welded steel pipe when said detecting signal has exceeded a specified preset level and has returned to said reference potential.

3. An apparatus for rotationally positioning a welded steel pipe in response to a seam section thereof comprising a driving means including a motor, for subjecting said welded steel pipe to a high speed-normal rotation and low speed-counter rotation about its axis, a sensor including first and second electromagnetic sensitive impedance elements juxtaposed in a manner approaching the outer surface of said welded steel pipe and spaced at a prescribed distance from each other circumferentially of said welded steel pipe, means for obtaining a detecting signal having a first peak voltage of one polarity and in succession a second peak voltage of the opposite polarity with the zero level interposed between said first and second peak voltages, in response to an impedance variation occurring in said first and second impedance elements in response to said seam section, a signal treating circuit for obtaining a pulse signal having a prescribed pulse width in response to said second peak voltage, and a control circuit for said driving means to change-over the rotation of said welded steel pipe from said high speed-normal rotation to said low speed-counter rotation when a pulse output has been produced from said signal treating circuit during said high speed-normal rotation and to stop said low speed-counter rotation of said welded steel pipe when a pulse output has been once again produced from said signal treating circuit during said low speed-counter rotation.

3,972,433

SELF LOADING AND CARRYING APPARATUS

Henry W. Reed, 1072 Stanley Drive, Clio, Mich. 48420

Filed Aug. 7, 1974, Ser. No. 495,403
Int. Cl.² B60R 9/00
U.S. Cl. 214—450 3 Claims

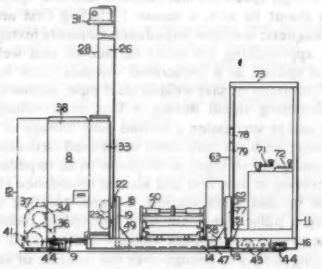
1. A self-loading apparatus for loading and carrying a load on a vehicle including the combination of a supporting frame adapted to be mounted on the vehicle and having forward and rearward support portions, a first elongated load supporting member having an intermediate portion thereof pivotally mounted on said forward frame portion for movement between a horizontal and a tilted position, a second elongated load supporting member slidably carried on the first elongated supporting member and longitudinally movable to the rear of the first elongated member from a retracted to an extended position in which said second member is engageable with the ground, a third load supporting member slidably carried on the first and second supporting members for movement to a position on said first member, means for moving said second member relative to the first member, and means on said second supporting member for movement into engagement with said rearward support portion upon movement of said second supporting member to its retracted position for supporting the first member in its horizontal position.

3,972,434

ORDER PICKER WITH OPERATOR'S PLATFORM ON THE FRONT END OF THE LOAD SUPPORT

Clifford G. Mecklenburg, Homewood, Ill., and Charles T. Evans, Rocky River, Ohio, assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 23, 1974, Ser. No. 536,028
Int. Cl.² B66F 9/14
U.S. Cl. 214—730 1 Claim



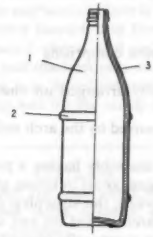
1. A lift truck comprising:
a main frame including
a rear portion and
a low, longitudinally elongated front portion rigidly secured to said rear portion having
a pair of laterally spaced and longitudinally extending legs rigidly secured at their rear ends to said rear portion and
a transverse brace extending between and rigidly secured to the front ends of said legs, said rear portion, legs and brace defining a vertically open pocket,
a plurality of wheels supporting said main frame including a drive wheel steerably mounted on and in supporting relation to said rear portion and wheels mounted on the front ends of said legs,
a vertical mast rigidly secured to said main frame at the rear of said pocket and at the front of said rear portion,
a power unit on said rear portion rearwardly of said mast operatively connected to said drive wheel,
a carriage mounted on said mast for vertical reciprocal movement between a lowered position and elevated positions, said carriage including a load support extending forwardly from said mast and disposed within said pocket in said lowered position of said carriage,
a side loading mechanism supported on said load support,
an operator's platform with truck operating controls disposed at the front of said load support forward of said side loading mechanism and supported on the forward part of said front portion of said main frame when said carriage is in said lowered position,
vertically confronting abutments on said load support and said operator's platform, said abutments being spaced from one another a predetermined vertical distance when said carriage is in its lowered position,
cooperating vertical guide structures on the front of said load support and the rear of the operator's platform, said guide structures permitting relative vertical motion between said operator's platform and said load support and preventing horizontal movement therebetween whereby said carriage is permitted to be elevated a predetermined distance from its lowered position before said abutments engage to elevate said operator's platform with said carriage.

3,972,435

SAFETY GLASS CONTAINER

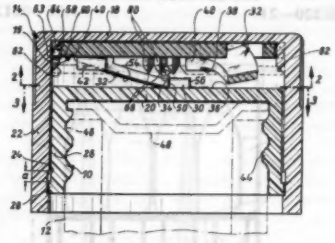
Takashi Sasaki, Kawanishi, and Masayuki Watanabe, Amagasaki, both of Japan, assignors to Yamamura Glass Kabushiki Kaisha, Japan

Filed Jan. 7, 1975, Ser. No. 539,226
Claims priority, application Japan, Oct. 23, 1974, 49-121508
Int. Cl.² B65D 23/08
U.S. Cl. 215—12 R 17 Claims



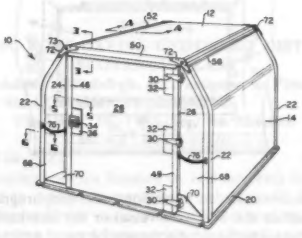
1. A safety glass container comprising in combination an elongated cylindrical hollow glass body strengthened chemically by the ion exchange method, a pair of protective cushioning materials consisting of a thermoplastic resin and encircling the shoulder portion and bottom portion of the glass body and a protective film sheath formed from a heat-shrinkable material encircling the glass body and cushioning materials.

3,972,436
SAFETY CLOSURE CAP
Hermann Grau, 7070 Schwab.-Gmund-Lindach, Lammleweg 8, Germany
Filed Dec. 2, 1975, Ser. No. 637,082
Claims priority, application Germany, Dec. 13, 1974, 2459030
Int. Cl.² B65D 55/02, 85/56; A61J 1/00
U.S. Cl. 215—220 6 Claims



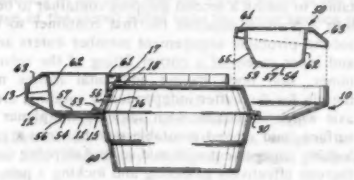
1. A safety closure cap for containers comprising first closure means, second closure means rotatably retained within said first closure means and for screwable attachment to a container, a disc member disposed between and coupled to one of said first and second closure means, said disc having at least one resilient tongue for maintaining the first and second closure means axially spaced from one another and forming part of a one-way coupling for automatically coupling the first and second closure means to move together in one direction of rotation of said first closure means for closing a container, the one-way coupling having a stop coupled to the other one of said first and second closure means, said resilient tongue having an edge portion for abutting against said stop in said one direction of rotation of said first closure means and over which the tongue slides in the other direction of rotation of said first closure means, and a coupling to permit the closure cap to be opened the coupling being engagable by moving said first and second closure means towards each other against the action of the resilient tongue.

3,972,437
CARGO CONTAINER
John W. Lovich; Oscar W. Meller, and Frank C. Morse, all of Akron, Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio
Filed Jan. 10, 1975, Ser. No. 540,054
Int. Cl.² B65D 7/00; B65J 1/02
U.S. Cl. 220—1.5 6 Claims



1. A cargo container having a basically cubicle framework, comprising:
a top interconnected with end panels and a back panel;
a base substantially parallel to the top and interconnected with the end panels and back panel;
a door hingedly connected on one side thereof to the framework;
latching means extending along the opposite side of the door and operative for making simultaneous latching engagement with the framework at a plurality of points; and
wherein the top and end panels are interconnected by dog-legged roof beams, said beams being capped at each end thereof with hoist brackets, each such bracket having a receptacle therein for making engagement with a lifting device.

3,972,438
FURNITURE FORMING SYSTEM
Gary J. Neville, 1644 - 20th St., Santa Monica, Calif. 90404
Filed Apr. 10, 1975, Ser. No. 566,989
Int. Cl.² B65D 7/00, 21/02
U.S. Cl. 220—4 R 7 Claims



1. In the art of construction of a rigid article such as furniture in combination, a group of three-dimensional modular members, at least one of said members having a bottom and sides and an upper part, including an extending flange structure, a second one of said members being constructed to be received and retained on said first member, said second member having a part configurated to interfit with the extending flange on the said one member whereby the members are held against relative lateral displacement, said one member being in the form of a circular tub having the extending flange at the periphery of its upper edge, said second member having a central open topped opening and being constructed to have an open topped peripheral cavity formed to receive open topped plant containers.

3,972,439
HORIZONTAL CONNECTOR FOR SHIPPING CONTAINERS
John M. DiMartino, 72 Lumur Drive, Sayville, N.Y. 11782
Filed June 5, 1974, Ser. No. 476,380
Int. Cl.² B65G 1/14
U.S. Cl. 214—10.5 R 12 Claims

1. A container connector for the independently releasable coupling of a pair of adjacent corner fittings of standard cargo containers, said corner fittings having an inner recess accessi-

ble through an elongated orifice on the facing surface thereof, said connector comprising:

a. means forming a body having a first planar outside surface for placing said first outside surface against said facing surface of one corner fitting of a first of said shipping containers;

b. said body supporting a first pivotable engagement member having an end portion extending beyond said planar outside surface, a generally transversely extending latching shoulder at said end portion, said end portion facing said first container for entering the orifice and inner recess of a corner fitting of said first container and shoulder means on said pivotal member mounted within said body and engageably actuable by a means linearly moveable generally transversely to said pivotable member, for thereafter rotating said first pivotable member around an axis which is parallel to the plane of said first planar outside surface within said recess into a gathering locking engagement with said first shipping container;

c. said body having a second planar outside surface parallel with and facing away from said first planar outside surface, said body supporting a second pivotable engagement member facing away from said first shipping container to permit a second shipping container to be moved into a position adjacent the first container so the said second pivotable engagement member enters an orifice and inner recess of a corner fitting of the second container, said body having additional means mounted therein for thereafter independently rotating, around an axis which is parallel with said second planar outside surface, said second pivotable member into a gathering locking engagement with said second shipping container, thereby effectively gathering and locking a pair of adjacent shipping containers.

3,972,440

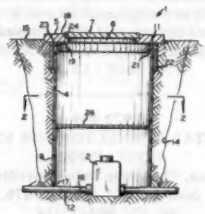
METER HOUSING

Donald K. Warren, Winchester, Va., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 20, 1975, Ser. No. 624,091

Int. Cl.² B65D *25/24, 7/42;* **E04B** *1/00*

U.S. Cl. 220—18 **7 Claims**



1. A housing adapted to be used to house a meter or the like underground, said housing including:

a. a member having opposite ends and a hollow interior defined at least partially by a side wall, said member having a first opening in one of said ends;

b. a cover engaging portions of said member adjacent said one end and is at least partially supported by said member, said cover overlies at least a portion of said first opening partially closing same and has a second opening communicating with said interior, said second opening has a size smaller than said first opening; and

c. a brace sized and shaped to fit within the interior of member and is removably retained therein, said brace is generally normal to said side wall and has at least one notch extending partially inwardly from the periphery of the brace and is defined by an edge, said edge is spaced from the opposite side of the brace a distance less than the distance across said second opening.

3,972,441

PLASTIC BOTTLE CASE

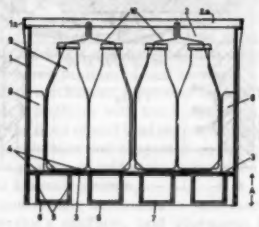
Ulrich Heinrich Prodel, Grunstr. 13, D4902 Bade Salzuflen, Germany

Filed Nov. 4, 1974, Ser. No. 520,885

Claims priority, application Germany, Nov. 23, 1973, 2358321

Int. Cl.² B65D *1/24, 75/00*

U.S. Cl. 220—21 **12 Claims**



1. A bottle packing comprising a unitary plastic bottle case adapted to receive bottles in carriers and also individual bottles not in carriers, said case comprising side walls and a bottom spaced upwardly from lower edges of said side walls, a plurality of bottle carriers received in said case and supported by said bottom, a plurality of bottles received in each of said carriers and means for securing said carriers from shifting laterally in said case. said means comprising support portions projecting inwardly from side walls of said case above said bottom in position to engage and position carriers in said case, said bottom having spaced openings to receive individual bottles not in carriers and bottle receptacles extending down from the edges of said openings a distance equal to the spacing of the bottom from the lower edges of the side walls of said case.

3,972,442

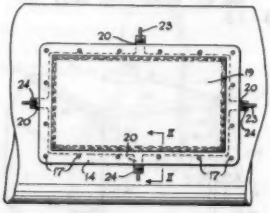
SAFETY EQUIPMENT

Brian Anthony Malcolm, Stockport, England, assignor to Simon-Carves Limited, Stockport, England

Filed Nov. 14, 1974, Ser. No. 523,929

Int. Cl.² B65D *25/00;* **B65B** *57/02, 57/18*

U.S. Cl. 220—89 A **11 Claims**



1. In combination, an explosion relief diaphragm or panel and a vessel or the like, said vessel or the like having a wall aperture over which said diaphragm or panel extends with its periphery secured pressure tight to said wall by means including sealing gasket means, said diaphragm having a plurality of outwardly extending tongue-like portions at spaced intervals around the periphery of said diaphragm or panel, sensing means, and means for mounting said sensing means adjacent

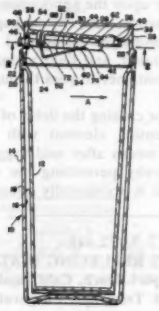
to said periphery so as to be operably responsive to the presence of each said tongue-like portion and adapted to signal a change in condition of said diaphragm or panel resulting in displacement of any of said tongue-like portions.

3,972,443

DRINKING RECEPTACLE

Kenneth J. Albert, Hollywood, Calif., assignor to Thermo Seal, Los Angeles, Calif.

Filed Nov. 1, 1974, Ser. No. 519,862
Int. Cl.² A47G *19/22*
U.S. Cl. 220—90.4 **5 Claims**



1. A drinking receptacle provided with a generally cup like body having a normally upper open end; a cover for said body removably and sealingly secured to said upper open end of said cup like body; said cover having a peripheral rim and a top plate portion surrounded by said rim; said top plate portion having upper and lower sides; said top plate portion having an outlet opening extending therethrough; said outlet opening being at a first location near the proximity of said rim; an openable valve disposed and adapted to close and open said drinking outlet opening; a finger engagable valve actuator movably mounted on said cover and being disposed at a second location near the proximity of said rim; said valve actuator having a shank integral with and fixed to said valve; said second location being disposed relative to said first location whereby said receptacle may be tilted to a disposition wherein said outlet opening is in a downward position and said valve actuator is in a relative upward position; said shank is provided with a poppet valve portion adjacent said actuator portion; said poppet valve portion adapted to seat against said side of said cover and in said opening therein around said shank; said poppet valve spaced from said openable valve so as to permit both valves to close concurrently in response to resilient action of said spring as it closes said openable valve in said outlet opening.

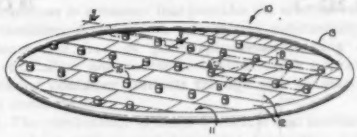
3,972,444

FLOATING ROOF HAVING UNIFORMLY DISTRIBUTED BUOYANCY MEANS

John H. Adams, Pittsburgh, Pa., assignor to Pittsburgh des Moines Steel Company, Pittsburgh, Pa.

Filed Apr. 10, 1975, Ser. No. 566,988
Int. Cl.² B65D *87/20*
U.S. Cl. 220—222 **17 Claims**

1. A floating roof for floating on and covering liquid material stored in a tank, comprising: a substantially flat, planar deck having an upper surface and a lower surface and a peripheral portion spaced from an inner wall surface of the tank; seal means secured to the peripheral portion to effect a seal between the floating roof and an inner surface of a tank wall; and a plurality of uniformly spaced apart, separate and independent buoy units secured to the deck and extending upwardly therefrom and each having a buoyancy when submerged in the stored product at least as great as the sum of its weight and the weight of a predetermined adjacent portion of the deck to provide uniform buoyant support to the deck in the event of leakage of stored liquid onto the upper surface of the deck and thus prevent sinking of the roof and minimize uneven settling of the deck in the stored liquid, said buoy units



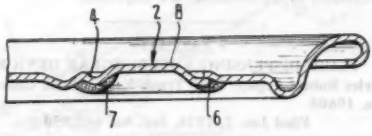
arranged such that lines drawn between the centers of any three mutually adjacent buoy units form a substantially equilateral triangle, thus minimizing stress in the deck and minimizing settling of the deck into the stored liquid in the event of leakage of the stored liquid onto the upper surface of the deck.

3,972,445

EASY-OPENING CONTAINER ENDS

Michael Debenham, Frankston, Australia, assignor to The Broken Hill Proprietary Company Limited, Melbourne, Australia

Filed Apr. 7, 1975, Ser. No. 565,702
Claims priority, application Australia, Apr. 5, 1974, 7178/74
Int. Cl.² B65D *41/32*
U.S. Cl. 220—268 **5 Claims**



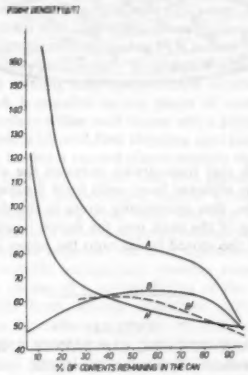
1. An easy opening push-in metal can end including at least one opening and closure therefor, and closure being severed from the can end except in a hinge area wherein said closure is connected to the remainder of said can end by a hinge connection of unsevered metal about which the closure hinges when it is pushed into the can to open same, the edge of the closure and the edge of the can end surrounding the opening in contact or in close proximity so as to form a juncture when the closure is in the closed position, a sealant applied around the juncture of said closure and the edge of the can end surrounding said opening, and a supplementary connection of sealant comprising a section of sealant in the region of said hinge connection, said section of increased strength relative to the remainder of said sealant, said section being wider than the remainder of said sealant by extending over the adjacent surface of said closure in a direction away from said hinge connection, said section of sealant being sufficiently flexible to permit hinging of said closure when it is opened and being of sufficient increased strength to substantially reduce the likelihood of detachment of said closure from said end in the event that said hinge connection is broken.

3,972,446

PRESSURIZED DISPENSERS

Jillian A. Williams, Thorpe, and Ronald James, Hillingdon, both of England, assignors to Wilkinson Sword Limited, Great Britain

Filed Aug. 14, 1974, Ser. No. 497,305
Claims priority, application United Kingdom, Aug. 18, 1973, 39151/73
Int. Cl.² B67B 7/24; C08K 5/01
U.S. Cl. 222—3 28 Claims



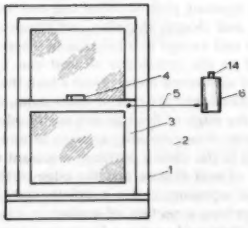
1. A pressurized dispenser comprising a container provided with a valve-controlled outlet and containing a concentrate and a reservoir holding propellant, the reservoir comprising a crystalline organic polymer capable of holding propellant therein in such a way that the vapor pressure over the held propellant is reduced below that over the pure propellant, the polymer being capable of holding at least 15% of its own weight of propellant at room temperature, and the reservoir being capable of releasing propellant within the container as the contents of the container are dispensed.

3,972,447

FLUID DISPENSING ANTI-BURGLAR DEVICE

Charles Robert Fegley, 1606 Frush Valley Road, Laureldale, Pa. 19605

Filed Jan. 2, 1976, Ser. No. 645,950
Int. Cl.² B67B 7/24
U.S. Cl. 222—5 23 Claims



1. A fluid dispensing anti-burglar device for use with a pressurized container, the device comprising:

a. a body member;

b. means for supporting said pressurized container in said body member, wherein said pressurized container has a fluid-dispensing element adapted to release fluid under pressure from said pressurized container when actuated;

c. a passageway in said body member having an entry section at one end thereof;

d. dispensing element-actuating means mounted in said body member and adapted to engage and actuate said fluid-dispensing element;

e. spring means biased to force said fluid-dispensing element and said dispensing element-actuating means into engagement with each other, thereby causing said fluid-dispensing element to be actuated;

f. trigger means adapted to releasably retain said spring means in a cocked position in which said fluid-dispensing element and said dispensing element-actuating means are separated from each other;

g. trigger-actuating means associated with said trigger to actuate said trigger upon the application of force to said trigger-actuating means, whereby said spring is released from its cocked position causing said fluid-dispensing element to be actuated, and fluid under pressure is released from said container to pass through said passageway;

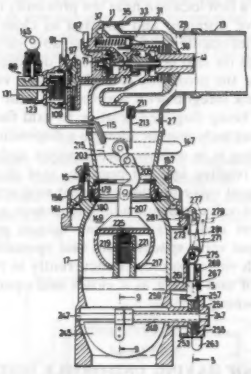
h. and delay means for causing the delay of the engagement of said fluid-dispensing element with said dispensing element-actuating means after said trigger releases said spring means, thereby permitting the resetting of the device if the trigger is accidentally released.

3,972,448

AIRCRAFT REFUELING SYSTEM

Albert W. Brown, Newport Beach, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 344,858, March 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 291,894, Sept. 25, 1972, abandoned. This application July 3, 1975, Ser. No. 593,008
Int. Cl.² B67D 5/38
U.S. Cl. 222—14 2 Claims



1. In an aircraft refueling system having a fuel storage tank and pump connected by fluid conduits to a plurality of stationary hydrants located at aircraft refueling stations, each of said hydrants including a valve for selectively prohibiting flow of fuel when the hydrant is not in use, the improvement comprising:

each of said hydrants having no pressure control means therein;

a plurality of portable pressure control valves, fewer than said plurality of hydrants, each of said pressure control valves being readily transportable by one operator for connection to one of said hydrants, said pressure control valves having means precisely regulating the pressure of

fuel flowing from said hydrants at a predetermined pressure level;

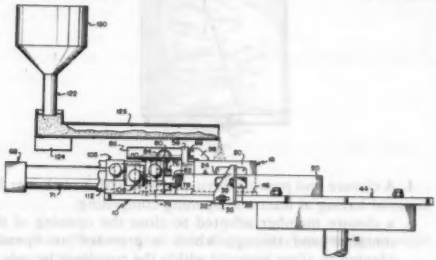
coupling means for connecting said pressure control valves to said hydrants, said coupling means permitting said pressure control valves to be quickly and easily moved from one hydrant to another, to facilitate a system with fewer pressure control valves than hydrants; and

fluid conduit means for connecting said pressure control valves to aircraft to be refueled.

3,972,449
POWER FEEDING APPARATUS

Bernard Francis Smith, Easton, Pa., assignor to Aeonic Press Company, Belvidere, N.J.

Filed Aug. 13, 1975, Ser. No. 604,424
Int. Cl.² B67D *5/14*
U.S. Cl. 222—64 **10 Claims**

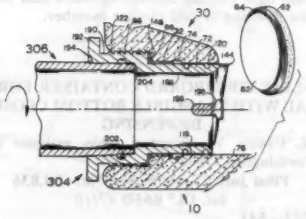


1. A powder dispensing apparatus which comprises a powder feed shoe, a wire grid suspended in a horizontal plane in a lower interior portion of said feed shoe, means for moving said feed shoe in a horizontal plane from a retracted position to a preselected extended position, and means for reciprocating said wire grid in a horizontal plane including means for varying the rate at which said grid is reciprocated relative to said feed shoe.

3,972,450
CONTAINERS

Tom Walters, 2102 Mason Blvd., Point Pleasant, W. Va. 25550

Filed Mar. 10, 1975, Ser. No. 556,938
Int. Cl.² B67B *7/26;* **B67D** *5/60;* **B65D** *7/02, 25/32*
U.S. Cl. 222—91 **14 Claims**



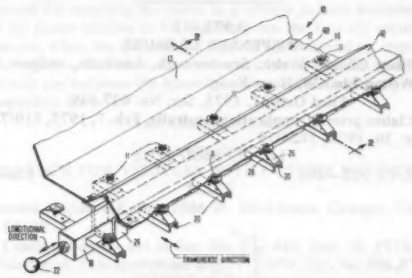
1. A tight head container molded from semi-rigid impact resistant high molecular weight high density polyethylene comprising the combination of a substantially cylindrical side shell section having molded continuous therewith an outward lattice pattern of horizontal and vertical solid reinforcing/water spray control ribs of substantially radial intersecting contours with said side shell, centrally located contact/roll rings, opposed container lifting recesses having lifting yoke pin positioning sockets, auxiliary internally and integrally sealed closed cycle dispensing connection above the bottom chime, and a convex head closure at the top end having a standard container fill connection, an auxiliary internally and integrally sealed closed cycle dispensing connection, a combination outward reinforcing/stacking and utility boss, a liquids dispensing orificed standing chime functional in conjunction with said outward lattice ribs and contact/roll rings, and a concave head closure at the bottom end having a combination outward reinforcing/stacking and utility boss, a standing grooved bottom chime, wherein the above container component configurations provide a continuity of molded strength throughout the container in a manner that provides the internal surface of the container with smooth intersecting substantially radial contours and free of potentially contaminating causing grooves, ledges and container content catch pockets upon dispensing container contents through said auxiliary closed cycle connections.

11. The combination of claim 1 wherein said auxiliary internally and integrally sealed dispensing connection includes a seal receiving chamber for the use with cutter/tapping adaptors for the removal of the container's liquid contents in a closed cycle manner without the escapement of vapors and liquids at said connection during the cutting/tapping procedure.

3,972,451
ADSORBER FILTER FILL SYSTEM CLOSURE APPARATUS

Harold Cheney Parish, Upper Arlington; Michael Duane Allard, Columbus; Jack Leland Pettit, Columbus, and Ivars Sigurds Spulgis, Columbus, all of Ohio, assignors to CVI Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 572,580, April 28, 1975. This application Sept. 17, 1975, Ser. No. 614,048
Int. Cl.² B67D *3/00*
U.S. Cl. 222—485 **11 Claims**



1. Apparatus for optionally opening and closing the adsorbent storage hopper portion of an adsorber filter fill system, thereby selectably permitting or preventing any granular adsorbent in the storage hopper portion of the adsorber filter fill system to flow downward out of the adsorber filter fill system, comprising:

a. metering means having a portion thereof which is of a generally flat, plate-like configuration, said metering means forming a bottom portion of a storage hopper of said adsorber filter fill system, said metering means having at least two holes through said flat portion thereof for regulating a downward flow of granular adsorbent, due to gravitational forces, out of said storage hopper, said holes being substantially symetrically distributed over said flat portion of said metering means;

b. a tongue located below said metering means and being disposed for longitudinal movement between two positions with respect to said metering means;

c. at least one support means for vertically supporting said tongue, said support means being secured to said metering means and having a shape whereby at least a portion of said support means is disposed sufficiently remote from said metering means so as to allow said tongue to reside

between said portion of said support means and said metering means;

d. at least one cross member secured to said tongue, and extending transversely therefrom for movement therewith;

e. at least two springs, at least one secured to each said cross member, the total number of said springs being the same as the number of said holes in said metering means, each said spring being means for maintaining a button sealing means in contact with said metering means;

f. means for securing each said spring to an associated cross member;

g. button sealing means pivotally mounted on each said spring, the number of said button sealing means being the same as the number of said holes in said metering means;

h. means for pivotally attaching each said button sealing means to said spring associated with said button sealing means; wherein when said tongue is at a first position with respect to said metering means, all of said holes in said metering means are open and granular adsorbent in the adsorber filter fill system can flow downward out of the storage hopper portion of said system but when said tongue is at a second position with respect to said metering means, each hole in said metering means is closed from below by one of said button sealing means and no granular adsorbent canflow downward out of the storage hopper portion of said system, said button sealing means being maintained in sliding contact with said metering means when said tongue is at said first position with respect to said metering means, when said tongue is at said second position with respect to said metering means and as said tongue moves with respect to said metering means between first and second positions, due to force exerted on said button sealing means by an associated spring.

3,972,452

DISPENSER CLOSURE

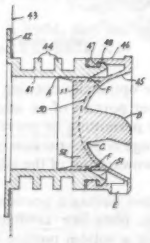
William Charles Welsh, Scarborough, Australia, assignor to Weltap Limited, Hong Kong

Filed Oct. 31, 1975, Ser. No. 627,649

Claims priority, application Australia, Feb. 7, 1975, 510/75; Apr. 30, 1975, 1424/75

Int. Cl.² B65D *27/36*

U.S. Cl. 222—501 **8 Claims**



1. A dispenser closure comprising a tubular spout to be connected at one end to a fluid container, and a diaphragmatic transverse wall of elastomeric material mounted across the other end of the spout, said transverse wall having a concave configuration which extends into said spout, an inwardly directed peripheral flange mounted on said transverse wall to sealingly engage with the inner tubular surface of said spout, a discharge outlet formed in a lower portion of said transverse wall providing communication between the exterior of said dispenser closure and a portion of the region of sealing engagement between the tubular surface of said spout and said peripheral flange, an outwardly directed protrusion extending from said transverse wall to be manipulated to distort the transverse wall and the portion of the peripheral flange adjacent the discharge outlet to cause fluid flow from the container through the discharge outlet.

3,972,453

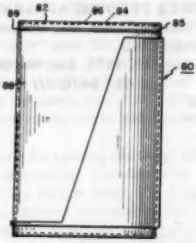
COMBINED CLOSURE AND POURING DEVICE

Lawrence J. Kapples, 502 Lenox Ave., Pittsburgh, Pa. 15221

Filed June 20, 1975, Ser. No. 588,686

Int. Cl.² B67D *5/37*

U.S. Cl. 222—530 **30 Claims**



1. A closure and pouring device for use with a container for material having at least one opening comprising:

a. a closure member adapted to close the opening of the container and through which is provided an opening adapted to allow material within the container to pass to the outside;

b. a spout extending from a peripheral portion of said closure member which is adapted to controllably conduct away from the container material which has passed out of the container through the opening in said closure member when said closure device is oriented spout-up on the container and which is adapted to extend external to and avoid physical interference with the structure of the container when said closure device is oriented spout-down on the container;

c. first means for engagement which is capable of providing fluid-tight closure contact between said closure member and the opening of the container when said closure device is oriented spout-up or spout-down on the container;

d. a lid member adapted to close the opening of said closure member; and

e. second means for engagement which is capable of providing fluid-tight closure contact between said lid member and the opening of said closure member.

3,972,454

DRUM-LIKE FIBERBOARD CONTAINER FOR BULK MATERIAL WITH FRANGIBLE BOTTOM CLOSURE FOR DISPENSING

Thomas E. Croley, Worthington, Ohio, assignor to Comco, Inc., Worthington, Ohio

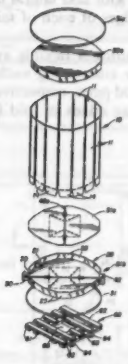
Filed July 31, 1975, Ser. No. 600,836

Int. Cl.² B65D *47/10*

U.S. Cl. 222—541 **16 Claims**

13. A container of fiberboard or the like comprising a tubular body, a bottom closure for the body including a bottom wall member having a frangible area which is weakened along selected lines to provide flaps which can be separated to form a dispensing opening, a tear-strip cooperating with said bottom wall member to permit tearing of the member to provide the separted flaps, and a second bottom wall member in the form of a liner member resting on the first-named bottom wall member, said liner member having a frangible area like the frangible area of the first bottom wall member superimposed relative thereto and having a similar cooperating tear-strip, each of the tear-strips extending across a medium line of its

respective bottom wall member, the superimposed bottom wall members being so arranged angularly relative to each

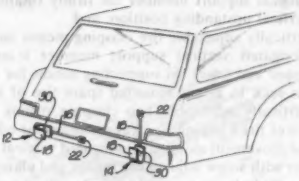


other that the tear lines are disposed substantially at right angles relatively.

3,972,455
PANTS AND SKIRT HANGER
Wesley A. Collins, P.O. Box 333, Chula Vista, Calif. 92012
Filed Oct. 2, 1975, Ser. No. 619,131
Int. Cl.[2] A47J 51/14
U.S. Cl. 223—96 2 Claims

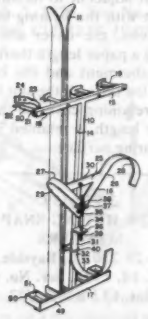
1. A hanger which comprises:
a central shaft;
two gripping sections pivotally connected to said shaft;
latching means for clamping the two gripping sections together;
a suspending hook; and
a bridge-shaped bracket pivotally connected at each end of said shaft and swivelledly fastened in its center to the lower end of said hook.

3,972,456
RACK FOR BICYCLES
Robert Saffold, 1401 Kenwood Road, Santa Barbara, Calif. 93109
Filed Sept. 17, 1973, Ser. No. 397,890
Int. Cl.[2] B60R 9/10
U.S. Cl. 224—42.03 B 7 Claims



1. A rack for carrying a bicycle on a vehicle comprising: a pair of substantially J-shaped bars, each bar having an upper part provided with a notch at its uppermost end for receiving the axle of a respective one of the wheels of the bicycle with the notch being positionable between the bicycle frame and the respective wheel, each bar further having a lower part provided with a pair of spaced members adapted for receiving the lower portion of a bicycle wheel therebetween to limit movement of the wheel transversely of its plane when the axle of the wheel is received in the notch of the corresponding bar; means coupled with the bars for securing the same to a vehicle in respective, spaced upright positions with said bars being laterally spaced from each other by a distance corresponding substantially to the wheel base of the bicycle; and means attachable to the frame of a bicycle intermediate the axles thereof for coupling the frame to a vehicle to limit movement of the frame relative to the vehicle when the bars are secured thereto, when the axles of the bicycle are received by respective notches, and when the lower portions of the wheels of the bicycle are between the spaced members of the lower parts of respective bars.

3,972,457
SKI RACK FOR VEHICLES WITH OUTSIDE MOUNTED TIRES
Gordon Maynard Kesler, 2506 W. 3965 South, Granger, Utah 84119
Continuation-in-part of Ser. No. 322,443, Jan. 10, 1973, abandoned. This application Sept. 17, 1974, Ser. No. 506,879
Int. Cl.[2] B60R 9/12
U.S. Cl. 224—42.42 R 5 Claims



1. A ski rack adapted for mounting to a rear mounted spare tire of a vehicle comprising:

a singular continuous, substantially elongated vertical support member,

a lower ski supporting means perpendicularly and centrally mounted to the lower extremity of said elongated vertical support member for receiving the heel or tail portion of a vertically positioned upstanding ski,

an upper ski supporting means perpendicularly and centrally mounted to the upper extremity of said elongated vertical support member for firmly retaining a ski in a vertical upstanding position, and

a vertically adjustable tire clasping means mounted to said elongated vertical support member intermediate said upper and lower ski supporting means for attaching said ski rack to a rear mounted spare tire of a vehicle, said vertically adjustable tire clasping means comprising a lower tire clasping bracket mounted for adjustable vertical movement along said elongated vertical support member with screw adjustment means and clamp means holding said clasping means to said vertical support member and an upper V-shaped tire clasping bracket fixed to said elongated vertical support member whereby each arm of said upper V-shaped tire clasping bracket is fixed at an angle of about 45° to said elongated vertical support member.

3,972,458

PAPER HOLDER

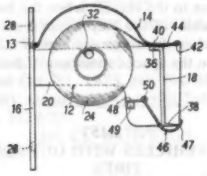
Shotaro Hamada, 12-35, Chuo 1-chome, Kofu, Yamanashi, Japan

Filed Sept. 15, 1975, Ser. No. 613,507

Claims priority, application Japan, Sept. 18, 1974, 49-111730[U]

Int. Cl.² B26F *3/02*

U.S. Cl. 225—20 **4 Claims**



1. A paper holder comprising a casing for rotatably supporting a paper roll and having a bearing surface over which a length of paper extends as it is reeled off the roll, and a retaining cover pivotally mounted on the casing at its one end and including an abutment adjacent to its other end which is located for engagement with the bearing surface with a paper interposed therebetween, the cover also including a withdrawal slot for passing a paper length therethrough after it has passed between the abutment and the bearing surface, the paper length which is led through the slot being turned around the other end of the retaining cover so that when it is pulled downward, the paper length is retained in position between the abutment and bearing surface.

3,972,459

TAPE DISPENSER HAVING SNAP LOCK CORE MEMBERS

Daniel A. Cooper, 61-29 230 St., Bayside, N.Y. 11364

Filed Apr. 14, 1975, Ser. No. 567,831

Int. Cl.² B26F *3/02*

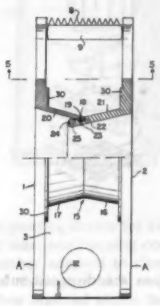
U.S. Cl. 225—47 **6 Claims**

1. Tape dispenser, comprising

a rectangular vertical oriented front part having an uppermost immoveable rigidly attached integral cutting edge and having elongated vertical lateral hinge edges extending integrally from said uppermost cutting edge.

two side parts each including a core member, each of said side parts including an elongated front hinge edge of a length larger than and extending adjacent to the entire length of said lateral hinge edges and extending above said cutting edge of said front part, with said cutting edge therebetween and with said lateral hinge edges between, said front hinge edges of each of said side parts, respectively,

hinge means constituting a flexible synthetic material for integrally pivotally connecting each of said front hinge edges of each of said parts, respectively, to a different one of said lateral hinge edges of said front part, extending



along the entire length of said lateral hinge edges including adjacent said cutting edge,

said core members including releasable snap locking means for holding said core members together in a substantially parallel position of said two side parts, and

said side parts each include a rear free end remote from said front hinge edge, said core members being located intermediate to said rear free ends of said side parts respectively and said front hinge edges respectively, said rear free ends of both of said side parts constituting in cooperation with said releasable snap locking means, a snap releasing means for releasing said core members from each other upon pressing of said rear free ends toward each other.

3,972,460

PAPER TRANSPORT MECHANISM

Donald E. Kesinger, Largo, and Michael B. Aaron, St. Petersburg, both of Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 24, 1975, Ser. No. 561,383

Int. Cl.² B65H *17/38*

U.S. Cl. 226—6 **13 Claims**

1. Apparatus for advancing record media including first drive means,

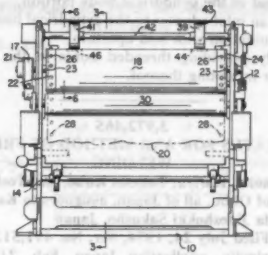
second drive means interconnected for operation with said first drive means,

means for driving said first and second drive means at a selected rate of operation, whereby said second drive means advances said record media at a predetermined rate,

friction means juxtaposed said first drive means and operably associated with said record media to cause said record media to be advanced by said first drive means at a rate greater than said predetermined rate, and

relief means in said first drive means and operably associated with said friction means for relaxing thereof in relation to said record media at predetermined times

during advancement of said record media by said first drive means, said second drive means maintaining advancement of said record media at said predetermined times.

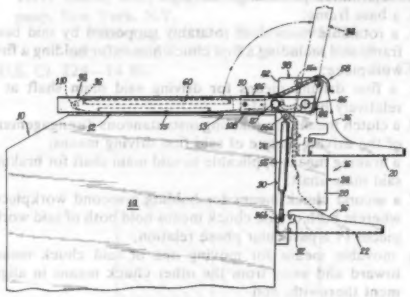


3,972,461

GUIDE CHUTE ARRANGEMENT FOR WEB FEEDING APPARATUS

George J. Zahradnik, Wheaton; Arthur A. Pudark, Downers Grove, and Carl L. Turner, Mount Prospect, all of Ill., assignors to A. B. Dick Company, Chicago, Ill.

Filed May 15, 1975, Ser. No. 577,704
Int. Cl.² B65H *23/04*
U.S. Cl. 226—89 9 Claims



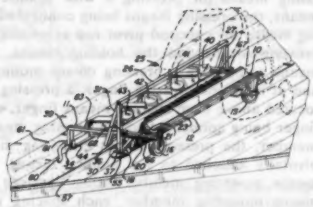
1. A guide chute assembly for guiding a web of material between the lower surface of a copyboard mounted on the original document platen of a copying machine and a supply tray, the copyboard being mounted on support means for pivotal movement about a first end of said copyboard between a first position overlying the platen and a second raised position, said guide chute assembly comprising upper and lower predeterminedly shaped wall portions spaced from each other a predetermined distance along the length thereof to form a channel therebetween through which said web passes, the lower wall portion being fixedly mounted on said support means, the upper wall portion being mounted at a first end on said support means for pivotal movement thereabout, the opposite end of said upper wall portion being coupled to said copyboard for movement along a predetermined path defined thereon in response to the movement of said copyboard from said first to said raised position, whereby said upper wall portion is pivoted about said first end and is moved away from said lower wall to permit easy insertion of said web into said channel.

3,972,462

SHINGLE LAYING MACHINE AND PROCESS

Brad D. Evans, Englewood; Charles E. Werner, Denver, and James S. Andrews, Westminster, all of Colo., assignors to Brad D. Evans, Englewood and Charles E. Werner, Denver, both of, Colo.

Filed Mar. 28, 1975, Ser. No. 563,183
Int. Cl.² B27F *7/02*
U.S. Cl. 227—111 8 Claims



1. Apparatus for accurately positioning shingles or the like relative to a reference edge on a subsurface such as the edge of a previously attached shingle and for attaching the positioned shingles to the subsurface comprising:

a tubular mounting framework,

at least two guide wheels,

means rotatably attaching said guide wheels to said framework with the axis thereof offset from the perpendicular relative to the subsurface by a relatively small acute angle so that the peripheral edges of said wheels will tangentially abut the reference edge,

a flat bar attached to said framework for positioning an elongated edge thereof a predetermined distance from and in facing relation to said peripheral edges of said wheels,

chute means attached to said framework for guiding a shingle in a generally flat orientation over said peripheral edges of said wheels into abutting relation to said flat bar elongated edge,

a plurality of fastener devices, and

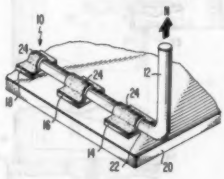
means pivotally mounting said fastener devices to said framework for selectably facing a shingle in said chute towards the subsurface and for fastening the shingle to the subsurface.

3,972,463

WIRE PLACEMENT FIXTURE

Edward James Conlon, Trenton; Ralph DeStephanis, Middlesex, and Thomas Tipton Hitch, Trenton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 7, 1975, Ser. No. 548,009
Int. Cl.² B23K *19/00*
U.S. Cl. 228—44.1 A 3 Claims



1. A fixture for placement of a preselected length of wire uniformly above a film on a microcircuit substrate comprising:

holding means for holding a substrate;

spacing means for spacing preselected points within the preselected length of a wire a predetermined distance

above a film comprising a spacing means mounting member and a spacing means finger, the finger being attached to the spacing means mounting member, the spacing means being connected to the holding means by a first pivot rod extending through the spacing means and the holding means, the spacing means mounting member being pivotally attached to the holding means by said first rod, and the spacing means finger being demountably attached to the spacing means mounting member;

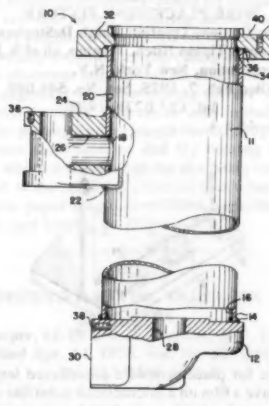
pressing means for pressing a wire against the spacing means, the pressing means being connected to the holding means by a second pivot rod extending through the pressing means and the holding means, the pressing means comprising a pressing means mounting member and at least one pressing finger, a pressing finger being located above each spacing means finger, each pressing finger being connected to the pressing means mounting member, the pressing means mounting member being pivotally attached to the holding means, the pressing means mounting member being opposite the spacing means mounting member, each spacing means finger adapted for placement above a film between a wire and a substrate, a pressing finger being spaced above each said spacing means finger the spacing means mounting member and the pressing means mounting member pivoting on parallel rods, the rods adapted to be located in a plane parallel to a substrate, the spacing means mounting member and the pressing means mounting member each being elongated along their respective axes, each mounting member having an axial hole therein, each mounting member having a pivot rod in the respective axial hole, each mounting member having a cylindrical surface uniformly spaced about the respective pivot axes and located proximate to the holding means, said holding means comprising a base member having a recesses space therein adapted for receiving a substrate, the recessed space being located between the mounting members, the base member further comprising means for receiving the respective pivot rods and a wire receiving means adapted for receiving a wire.

3,972,464

FRICTION WELDED FILTER HOUSING

Edward A. Codo, and Donald J. Larson, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 27, 1974, Ser. No. 455,501
Int. Cl.² B23K *19/02*
U.S. Cl. 228—112 **1 Claim**



1. A method of making a filter housing comprising, in the following sequence, the steps of

first friction welding a cylindrical body portion to a first end member,

then providing an aperture in said body portion,

thereafter friction welding a second end member to the other end of the cylindrical body portion,

attaching an inlet adapter to the cylindrical body portion in communication with said aperture,

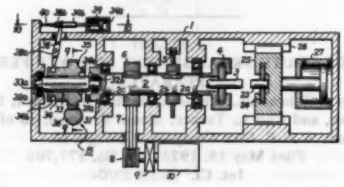
and finally providing threaded bores in the second end member mounting thereof.

3,972,465

APPARATUS FOR AND METHOD OF FRICTION WELDING

Hikaru Takaoka, Kariya; Takeshi Kubo, and Toshihiko Hayashi, both of Ohbu, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Sakusho, Japan

Filed July 24, 1974, Ser. No. 491,512
Claims priority, application Japan, Feb. 21, 1974, 49-20893; July 27, 1973, 48-85183; July 27, 1973, 48-85182
Int. Cl.² B23K *28/00*
U.S. Cl. 228—112 **6 Claims**



1. In an apparatus for friction welding metal workpieces at a predetermined phase angle having

a. a base frame;

b. a rotatable main shaft rotatably supported by said base frame and including a first chuck means for holding a first workpiece;

c. a first driving means for driving said main shaft at a relatively high speed;

d. a clutch means for enabling instantaneous disengagement of the driving torque of said first driving means;

e. a braking means applicable to said main shaft for braking said main shaft;

f. a second chuck means for holding a second workpiece, wherein both of said chuck means hold both of said workpieces in a particular phase relation;

g. movable means for moving one of said chuck means toward and away from the other chuck means in alignment therewith; and

h. a pressure-applying means for providing a contacting force to generate heat by friction between said workpieces, the improvement comprising:

1. movable stopping means selectively engageable with said main shaft for stopping the rotation of said main shaft, said movable stopping means assuring that said workpieces are welded together with a predetermined phase angle;

2. second driving means including a hydraulically operated rack and a pinion gear engaging with said rack for driving said main shaft at a relatively low constant speed with respect to the normal running speed of said first driving means, said second driving means continuously driving said main shaft at low constant speed before said movable stopping means stops the rotation of said main shaft, said second driving means rotating said main shaft with a torque sufficient to overcome the fricional force between said workpieces when said pressure-applying means provides the contacting force; and

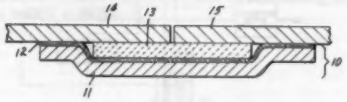
3. means for stopping said second driving means at a given position of the advancing stroke of said rack.

3,972,466

HIGH TEMPERATURE WELDING BACKUP STRIP

Roger H. Keith, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 15, 1975, Ser. No. 568,259
Int. Cl.[2] B23K 9/02
U.S. Cl. 228—216 11 Claims



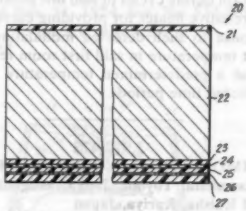
1. In a welding backup tape capable of being wound in roll form convolutely about a core, comprising a narrow, elongate flexible sheet backing having, joined to one face thereof, a layer of refractory material for spanning the joint between two abutted pieces to be welded and being held in position during the welding operation to support the weld material, the improvement which comprises utilizing as at least part of said backing a woven carbon fiber cloth, whereby said tape resists extremely high welding temperature without burning through said backing.

3,972,467

PAPER-BOARD LAMINATE

Allan A. Whillock, Mobile, Ala., and James Wesley Yount, Terre Haute, Ind., assignors to International Paper Company, New York, N.Y.

Filed Aug. 6, 1974, Ser. No. 495,253
Int. Cl.[2] B65D 15/22; B32B 21/06, 15/08
U.S. Cl. 229—14 BL 26 Claims



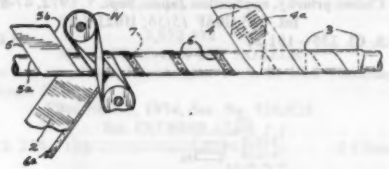
1. A laminate comprising:
a layer of a paperboard base stock;
a first layer of a thermoplastic material having a thickness of greater than about 0.0005 inches bonded to said layer of paperboard base stock;
a layer of a polymer film having a thickness of between about 0.0003 inches and 0.0015 inches bonded to said layer of paperboard base stock, said polymer film having a tensile strength at the yield point greater than about 4000 p.s.i. and an elongation at fracture greater than about 200%; and
a second layer of a thermoplastic material having a thickness of greater than about 0.0005 inches bonded to said layer of a polymer film.

3,972,468

REFRIGERATED DOUGH CAN

Francis R. Reid, Minneapolis, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

Filed Nov. 28, 1975, Ser. No. 635,818
Int. Cl.[2] B65D 81/34, 83/00
U.S. Cl. 229—51 BP 10 Claims



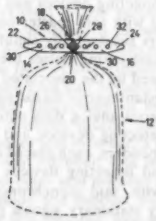
1. A spirally wound composite cylindrical can adapted to open in a single manipulative step and having a discrete label and reinforcing element, said can comprising a spirally wound bodystock sheet having a pair of side edges and a butt joint between the adjacent side edges thereof, the butt joint extending generally spirally of the can, a liner composed of flexible sheet material bonded to the bodystock sheet and having a seam underlying the butt joint and being adjacent thereto and extending spirally of the can so as to be co-extensive with the butt joint, the seam between the edges of the liner being rupturable and peelable and including an inner lap and an outer lap adjacent thereto, one of said laps being folded in the direction of the other lap to form a hem and said hem being adhesively bonded to the other lap to define said peelable joint, the peelable joint aligned with the butt joint providing substantially no strength at the butt joint, a tensile element comprising a reinforcing strip removably adhesively bonded to the outer surface of the bodystock sheet over the butt joint, and the adhesive bond between the reinforcing strip and the bodystock being rupturable and serving to hold the adjacent edges of the butt joint together prior to removal of the reinforcing strip, a label formed from flexible sheet material removably bonded to the outer surface of the bodystock sheet whereby removal of the reinforcing strip allows the can to easily open with the application of little if any externally applied force.

3,972,469

BAG CLOSURE

Charles E. Wright, 80 Lynwood Ave., Toronto, Ontario, Canada

Filed Apr. 3, 1975, Ser. No. 564,791
Claims priority, application Canada, Feb. 28, 1975, 221290
Int. Cl.[2] B65D 33/16
U.S. Cl. 229—62 6 Claims



1. A bag closure securable around the neck of a flexible bag, comprising an elongated strip of synthetic plastic material having opposite end portions connected by a pair of laterally spaced flexible ribbon portions, said ribbon portions each having a thickness less than the thickness of the end portions.

3,972,470

ELECTRIC POWER SYSTEM SUPERVISORY CONTROL SYSTEM COMPRISING A/D CONVERTERS AT VARIOUS POINTS OF THE POWER SYSTEM

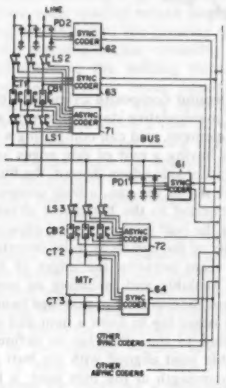
Toshio Takagi, Tokyo, Japan, assignor to Tokyo Denryoku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 386,382, Aug. 7, 1973, abandoned. This application Mar. 27, 1975, Ser. No. 562,452

Claims priority, application Japan, Sept. 7, 1972, 47-89794

Int. Cl.[2] G06F *15/56;* H02J *3/06*

U.S. Cl. 235—151.21 3 Claims



1. A supervisory control system for supervising and controlling an electric power system by the use of digital signals representative of instantaneous analog data of first preselected points of the power system and inherently stationary data of second preselected points of the power system, said control system comprising:

first detecting devices coupled to said power system at said first preselected points for detecting said instantaneous analog data to produce instantaneous analog signals representative of said instantaneous analog data;

second detecting devices coupled to said power system at said second preselected points for detecting said inherently stationary data to produce inherently stationary signals representative of said inherently stationary data;

a master oscillator for producing timing pulses;

synchronized encoders, each placed adjacent to at least one of said first detecting devices and electrically associated therewith and with said master oscillator, said synchronized encoders substantially simultaneously sampling in response to said timing pulses the instantaneous analog signals produced by the associated first detecting devices to produce instantaneous digital signals representative of the instantaneous analog data detected by the last-mentioned first detecting devices; and

asynchronous encoders, each placed adjacent to at least one of said second detecting devices and electrically associated therewith, said asynchronous encoders sampling the inherently stationary signals produced by the associated second detecting devices to produce sampled inherently stationary signals representative of the inherently stationary data detected by the last-mentioned second detecting devices;

said instantaneous digital signals and the sampled inherently stationary signals being used as the first-mentioned digital signals.

3,972,471

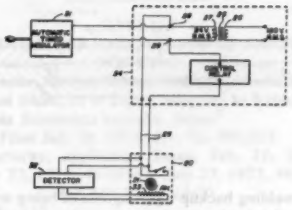
AUTOMATIC TEMPERATURE SETBACK SYSTEM FOR CONTROLLING A HEATING UNIT

Ronald N. Ziegler, P.O. Box 3243, Wescosville, Pa. 18106

Filed May 27, 1975, Ser. No. 581,285

Int. Cl.[2] G05D *23/30*

U.S. Cl. 236—46 R 21 Claims



1. A temperature setback controlling system suitable for use in a building wherein a thermostat having a room temperature sensing element is employed on a wall in a first room to sense room temperature for control of a heating system effective in said first room to maintain a thermostat selected ambient room temperature, wherein heating controls for said system including a transformer having a secondary winding for providing low voltage, 60 Hz power are located in a second room of said building, and wherein a thermostat cable coupling said thermostat in said first room to said heating controls in said second room is located at least partially within interior walls of said building, said temperature setback controlling system comprising

timed control means, adapted to be coupled to said transformer winding, for modulating during selected time periods cycles of one polarity of said 60 Hz low voltage with a high frequency;

a resistive heater, adapted to be placed in proximity to said room temperature sensing element; and

detector means, adapted to be coupled to said thermostat cable in said first room, for detecting said high frequency modulation during cycles of said one polarity and coupled to said resistive heater for providing current flow thereto in response to such detected modulation, whereby the ambient temperature in said first room tends to be maintained at a predetermined temperature setback during said selected time periods.

3,972,472

THERMOSTATICALLY RESPONSIVE VALVE

Yasuhiro Kawabata, Toyoto, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 11, 1974, Ser. No. 514,082

Claims priority, application Japan, Oct. 12, 1973, 48-114985

Int. Cl.[2] G05D *23/02*

U.S. Cl. 236—87 6 Claims

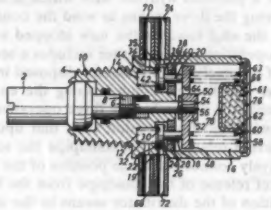
1. A thermostatically responsive valve comprising: a housing provided at one end with an air chamber including an air inlet port, a vacuum chamber in said housing separated from said air chamber and including a vacuum inlet port to be connected with a source of vacuum; and an outlet chamber including an outlet port provided in said housing between said air and vacuum chambers;

a thermal element expansible in response to change of ambient temperature assembled with said housing at the end opposite said air chamber, said thermal element having a power member extending through said housing into said air chamber only and being completely spaced from contact with the vacuum and outlet chambers;

a movable member separably mounted on the extended portion of said power member within said air chamber to be moved by said thermal element in one direction;

a return spring within said air chamber engaging said movable member and biasing the member so as to return it in the opposite direction;

a valve means disposed within said outlet chamber and separably engaged with said movable member to normally close the communication between said vacuum and outlet chambers and open the communication between said air and outlet chambers due to the biasing force of said return spring; and



a valve spring disposed within the vacuum chamber biasing said valve means in the direction opposite to the biasing direction of said return spring, the biasing force of said valve spring being smaller than that of said return spring;

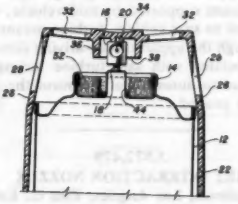
whereby upon movement of said movable member against the biasing force of said return spring in response to expansion of said thermal element, said valve means is freed from the biasing force of said return spring so that said valve means is biased only by said valve spring to open the communication between said vacuum and outlet chambers and to close the communication between said air and outlet chambers.

3,972,473

SPRAY AND EVAPORATIVE AIR FRESHENER COMBINATION

Thomas S. Harrison, New Canaan, Conn., assignor to Sterling Drug Inc., New York, N.Y.

Filed Nov. 21, 1974, Ser. No. 525,859
Int. Cl.² A24F *25/00*
U.S. Cl. 239—34 **14 Claims**



1. A combined spray and evaporative air freshener comprising the combination of an aerosol container having a manually depressible valve stem actuator, a valve stem, and a valve cup in which the valve stem is located, the valve actuator including a spray orifice,

with a shroud for the aerosol container, said shroud comprising a hollow main body portion slidable relative to the aerosol container, said shroud having a top, a side wall, and an open bottom, a depending shroud cup with an open bottom and generally closed top at the interior of the shroud generally aligned with the valve actuator, said shroud cup including a generally solid wall in the path of the aerosol spray orifice,

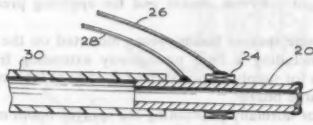
said shroud and its cup being bodily manually depressible causing the shroud cup top to depress the valve actuator to actuate the valve thereby spraying content of the aerosol onto the interior surface of said shroud cup, whereby fluid from the aerosol is collected thereon and descends into and is caught and held by the valve cup.

3,972,474

MINIATURE INK JET NOZZLE

Robert I. Keur, Niles, Ill., assignor to A. B. Dick Company, Chicago, Ill.

Filed Nov. 1, 1974, Ser. No. 520,025
Int. Cl.² B05B *17/06*
U.S. Cl. 239—102 **5 Claims**



1. A nozzle for an ink drop writing system having a mechanical resonance frequency which is at least 1.5 times higher than the frequency of operation of the system and a fundamental fluid resonance frequency which is at least 1.06 times higher than the frequency of operation of the system.

3,972,475

NOZZLE CONSTRUCTION PROVIDING FOR THERMAL GROWTH

Roy G. Nelson, Lake Park, and Louis H. Wolfson, Juno Isles, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed July 31, 1975, Ser. No. 600,545
Int. Cl.² B64C *15/06*; F02K *1/24*
U.S. Cl. 239—127.3 **6 Claims**

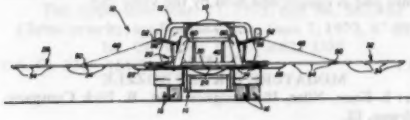
1. In combination with jet engine fixed structure including an exhaust duct; an exhaust nozzle mounted on said fixed structure; said nozzle comprising a circumferential row of flaps; means pivotally mounting said flaps on said fixed structure for controlling the flow of said exhaust duct; seal means being positioned between each pair of flaps to prevent leakage therebetween; said flaps comprising an inner flap member having an outer flap member spaced therefrom; said seal means comprising an inner seal member, a guide and support means, and an outer seal member; said inner seal member being spaced from said outer seal member by said guide and support means; said guide and support means being fixedly mounted to said outer seal member; said inner seal member being fixedly connected to said guide and support means at one point with the remainder of the inner seal member and guide and support means being permitted relative axial movement; said flaps and said seal means cooperating to provide a passageway for coolant flow through said flaps and seal means.

3,972,476

MOBILE FLUID SPRAYER SYSTEM

Mark G. Hall, Rte. 2 P.O. Box 269, Bryan, Tex. 77801

Filed Feb. 21, 1975, Ser. No. 551,821
Int. Cl.² B05B 1/20
U.S. Cl. 239—167 19 Claims



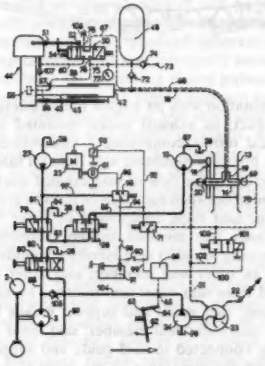
1. A mobile fluid sprayer system comprising:
a vehicle adapted for movement over a surface;
fluid reservoir means mounted on the vehicle;
means mounted on the vehicle for withdrawing fluid from the fluid reservoir means and for applying pressurized fluid;
at least one sprayer boom means mounted on the vehicle and including a fluid passageway extending from the means for supplying pressurized fluid to at least one fluid discharge nozzle;
means for normally positioning the sprayer boom means in a laterally extending orientation relative to the vehicle and permitting the sprayer boom means to pivot freely upwardly and rearwardly in response to engagement of the sprayer boom means with an obstruction;
means for damping the return movement of the sprayer boom means from a pivoted position relative to the vehicle to the normal position relative thereto; and
the damping means further comprising means to damp the return movement of the sprayer boom means at a graduated rate with the damping rate being greatest when the sprayer boom means is at or near the normal position and with the damping rate being reduced as the sprayer boom means is pivoted away from the normal position.

3,972,477

WATERING APPARATUS HAVING AUTOMATIC FEED

Maurice Laureau, 7, Rue du Lieutenant Boulay, Pringy, 77310 Saint Fargeau Ponthierry, France

Filed Mar. 3, 1975, Ser. No. 554,544
Claims priority, application France, Mar. 1, 1974, 74.07096
Int. Cl.² B05B 3/18
U.S. Cl. 239—183 7 Claims



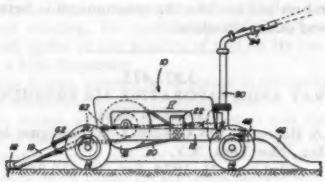
1. In watering apparatus of the type in which a first vehicle travels along a pipe having hydrants spaced therealong, the vehicle having a rotatable reel on which a first flexible conduit is wound, the conduit having one end fixed to the vehicle with a spraying device thereon, the other end of the conduit extending rearwardly of the vehicle and being connected to a standpipe carried by the sled and adapted for being releasably engaged with a hydrant so that water under pressure in the hydrant can be delivered to the conduit and the spraying device, the improvement comprising a hydropneumatic accumulator coupled with the standpipe for receiving a supply of water under pressure, drive means on said vehicle for driving the reel in rotation such that with the vehicle at rest the sled is pulled towards the vehicle by winding of the flexible conduit on the reel, operating means coupled to the accumulator, the drive means and the standpipe for halting the vehicle after it has traveled past a hydrant, then releasing the standpipe on the sled from a previous hydrant with which it is engaged, thereafter driving the drive means to wind the conduit on the reel and pull the sled towards the now stopped vehicle and wherein said operating means further includes a second flexible conduit of relatively small diameter disposed in the interior of the first said flexible conduit along the entire length thereof, a distributor means having three operative positions and coupled with said first conduit such that upon forward movement thereof relative to the standpipe the second conduit is operatively connected in one position of the distributor means to effect release of the standpipe from the hydrant, in a second position of the distributor means to the atmosphere and in a third position of the distributor means to a switch means for controlling starting of the drive means.

3,972,478

HYDRAULIC ACTUATED LOAD SENSING GOVERNOR

Jay C. Groelz, Phillips, Nebr., assignor to Heinzman Engineering, Inc. (Entire), Grand Island, Nebr.

Filed Dec. 30, 1975, Ser. No. 645,478
Int. Cl.² B05B 3/18
U.S. Cl. 239—189 12 Claims



1. Irrigation apparatus comprising; a ground moving vehicle, sprinkler means supported by said vehicle, water supply means connected to said vehicle, turbine means actuated by water flow through the apparatus for driving same, and governor means associated with said turbine means for sensing variations in load to automatically control the speed of the vehicle over the ground.

3,972,479

JET INTERACTION NOZZLE

Richard A. Calabrese, Los Angeles; Ellis G. Estes, Redondo Beach; Dean F. Hopkins, Costa Mesa, and Walter W. Johnson, Malibu, all of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

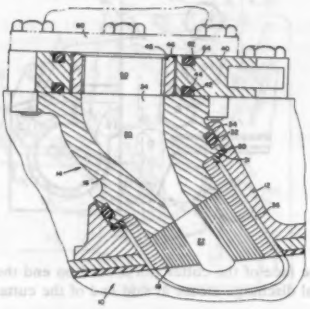
Filed Apr. 30, 1975, Ser. No. 573,184
Int. Cl.² B64D 33/04; F02K 1/22
U.S. Cl. 239—265.11 1 Claim

1. A thruster jet for use with a vehicle,
said thruster jet comprising a titanium nozzle section having a flow passage therethrough and a relatively long exit extension fastened to the exit of said titanium section and projecting along the same longitudinal axis as the axis of the exit portion of said titanium section,

said flow passage having an inlet portion of circular cross section and an exit of slot shaped cross section,

said exit portion having a high length to width aspect ratio,

a smooth gradual transition between the inlet and exit portions of said flow passage from said circular cross section to said slot cross section,



a gradual bend in said flow passage between the inlet and exit ends thereof so that the longitudinal axis of the exit is canted forward with respect to the longitudinal axis of said inlet,

said exit extension being shaved to the exterior contour of the vehicle in which the nozzle is installed after installation thereof,

said extension being made of quartz cloth impregnated with phenolic resin.

3,972,480

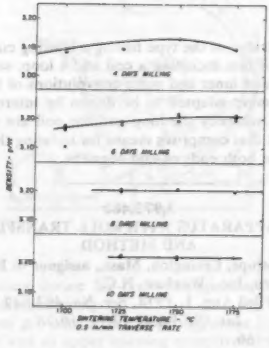
METHOD OF PREPARING A SUSPENSION OF ADDITIVE-FREE BETA-ALUMINA PARTICLES

Robert W. Powers, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 29, 1975, Ser. No. 581,807

Int. Cl.² B02C *19/12*

U.S. Cl. 241—15 **5 Claims**



1. A method of preparing a suspension of additive free beta-alumina particles which comprises providing water-free beta-alumina with a particle size greater than 2 microns, adding the particles to an organic fluid vehicle having a dielectric constant at 25°C of from 12 to 24, adding beta-alumina grinding media, vibromilling the beta-alumina particles for a period of time to reduce the particle size wherein a majority of the particles have a size in the range of from 0.5 to 2 microns thereby providing a suspension of the additive-free beta-alumina particles in the organic fluid, and removing the suspension from the grinding media.

3,972,481

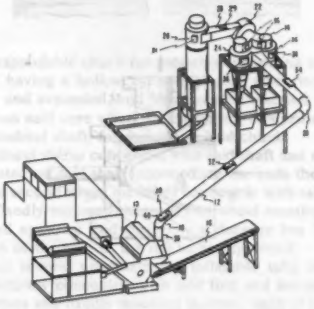
SHREDDING SYSTEM IMPROVEMENT TO SUPPRESS EXPLOSIONS

Joseph F. Naporano; Benjamin A. Baker, both of Livingston; Steven J. Tunkel, Whippany; Chester Grelecki, Rockaway, and George L. Van Houten, Essex Fells, all of N.J., assignors to Nimco Shredding Co., Newark, N.J.

Filed Dec. 18, 1974, Ser. No. 533,780

Int. Cl.² B02C *23/04*

U.S. Cl. 241—30 **35 Claims**



1. An improvement in the process for shredding scrap metal and the like including the scrap metal in a hammer mill, separating the reduced scrap metal emerging from the hammer mill, collecting dust and the like from the process of reducing scrap metal in the hammer mill, and feeding the dust and the like through duct work from the hammer mill to a dust collector, the improvement for the elimination of damage from explosions comprising:

a. Venting internal pressure through venting devices adapted to vent when internal pressure within the hammer mill, duct work and dust collector reaches a level within the range of 0.2 psig to 1.25 psig.

3,972,482

ELECTRO-CHEMICAL CORROSION OF WORKING ELEMENTS

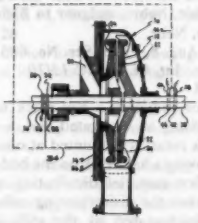
Alistair K. Bodycomb, Baie d'Urfe, Canada, assignor to Domtar Limited, Montreal, Canada

Filed May 13, 1975, Ser. No. 577,048

Claims priority, application United Kingdom, May 18, 1974, 22268/74

Int. Cl.² B02C *7/11*

U.S. Cl. 241—30 **5 Claims**



1. A method of reducing corrosion of working elements processing materials under condition wherein said elements are subject to corrosion and abrasion and wherein said ele-

ments are mounted on a frame and one of said elements is moved relative to the other, said method comprising electrically connecting said relatively moving element to said frame thereby to maintain said relatively moving element at substantially the same potential as said frame.

3,972,483

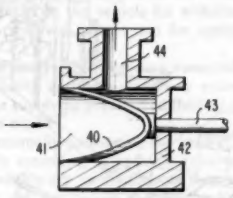
PUMPING AND PULVERIZING APPARATUS

Georg Neidl, Furst Johannes Strasse, Schaan, Liechtenstein

Filed Mar. 17, 1975, Ser. No. 558,919

Int. Cl.² B02C *23/36*

U.S. Cl. 241—46.11 **17 Claims**



1. In pumping and pulverizing apparatus, the combination comprising a housing having an interior wall defined by a surface of revolution, an inlet opening in said interior wall of the housing concentric with the axis of said surface of revolution, a rotor mounted on a drive shaft for rotation concentric with said axis, at least one outlet opening in the housing for discharging material, said rotor including at least two blades having symmetrical surfaces disposed on opposite sides of a plane passing through said axis and diverging outwardly towards said inlet from a common locus of attachment to said drive shaft with their respective extremities intersecting the wall of the housing on opposite sides of the inlet opening and between said inlet and outlet openings, said locus of attachment being adjacent the housing wall opposite the inlet opening said shaft entering the housing through said wall opposite the inlet and terminating at said locus of attachment, at least one portion of the margin of each blade extending between said locus and the respective extremity of that blade having an outline conforming to the adjacent interior wall of the housing.

3,972,484

HAY STACK DISINTEGRATING APPARATUS

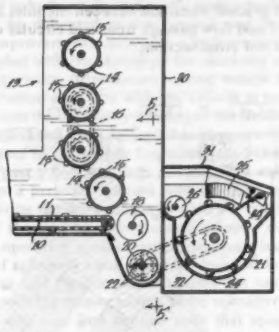
Kelly P. Ryan, Blair, Nebr., assignor to Blair Manufacturing Company, Blair, Nebr.

Filed Aug. 8, 1975, Ser. No. 603,106

Int. Cl.² B02C *13/20*

U.S. Cl. 241—154 **4 Claims**

1. Apparatus for reducing a hay stack to a short length cattle feed comprising an elongated bed, a vertical array of disintegrating rolls rotatably mounted at one end of the bed, a conveyor for moving a hay stack on the bed into said disintegrating rolls, a first material distributing means extending across the bed below the disintegrating rolls and adapted to move material disintegrated by the rolls in one direction across the bed, a second material distributing means beneath the first material distributing means and adapted to move material received from said first material distributing means across the bed in the opposite direction, a rotatably mounted cutter roll positioned to receive material from said material distributing means, means for moving material transversely



across the face of the cutter roll toward on end thereof, and a material discharge means at said end of the cutter roll.

3,972,485

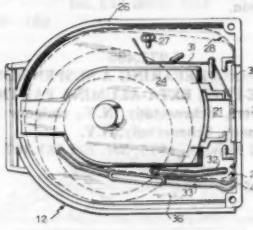
ENDLESS-ROLL FILM CARTRIDGE

Frederic F. Grant, Bellflower, Calif., assignor to Technicolor Corporation, Hollywood, Calif.

Filed Jan. 9, 1975, Ser. No. 539,624

Int. Cl.² B65H *17/48*

U.S. Cl. 242—55.19 A **15 Claims**



1. In a cartridge of the type having a housing containing an endless roll of film including a coil and a loop, said loop extending between inner and outer convolutions of the coil and having a segment adapted to be driven by intermittent film drive means, whereby the loo and the coil are moved, the improvement that comprises means for isolating the inertia of said coil from both ends of said segment.

3,972,486

WINDING APPARATUS WITH ROLL TRANSFER MEANS AND METHOD

John E. Straujups, Lexington, Mass., assignor to Birch Brothers Southern, Inc., Waxhaw, N.C.

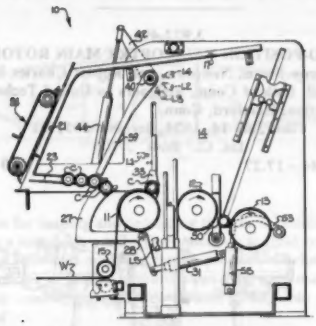
Filed Aug. 1, 1974, Ser. No. 493,847

Int. Cl.² B65H *17/12, 19/28*

U.S. Cl. 242—66 **9 Claims**

9. Winding apparatus comprising a pair of spaced apart upstanding end frames, means for receiving elongate winding cores which extend substantially from one of said end frames to the other and for supporting a core in a first winding position for winding a roll of web material to a predetermined initial size, the web material optionally being of full width so that only short opposite end portions of the core extend beyond the roll or of considerably lesser width so that substantial opposite end portions of the core extend beyond the roll, means for receiving the initial size roll of web material from

the first winding position and for supporting the roll in a second winding position during continuation of winding to a final size, and a pair of transfer arm means adjustably movable inwardly of said end frames for being positioned closely adjacent opposite ends of the initial size roll of web material for



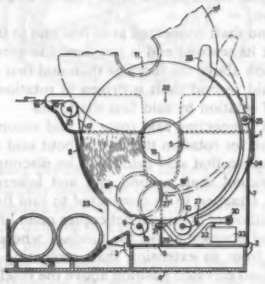
engaging the opposite end portions of the winding core at locations spaced inwardly from opposite ends thereof and transferring the same from the first winding position to the second winding position whereby transfer of various width rolls may be smoothly effected without encountering flexure and rupture of winding cores.

3,972,487

LOADING DEVICE FOR REELS OF PAPER TAPE

Armando Costa, Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed June 11, 1975, Ser. No. 586,001
Claims priority, application Italy, Aug. 27, 1974, 69614/74
Int. Cl.² B65H *75/12*
U.S. Cl. 242—68.7 **7 Claims**



1. A loading device for reels of paper tape wound on a central spool comprising:

a container provided with an opening at the bottom portion thereof and an upper opening receptive of reels of paper tape, introduced one at a time into said container through said upper opening,

support means for supporting said reels, and

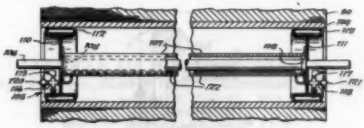
ejection means movable in said container and engageable with said reel which is successively inserted to effect the movement of said ejection means from a rest position to an ejection position in order to eject through said bottom opening said central spool of the preceding reel, now completely unwound.

3,972,488

EXPANDABLE CHUCK

Charles A. Lee; Warren R. Furbeck, and Horace N. Kemp, all of Knoxville, Tenn., assignors to International Paper Company, New York, N.Y.

Division of Ser. No. 114,994, Feb. 12, 1971, Pat. No. 3,841,620. This application June 20, 1974, Ser. No. 481,327
Int. Cl.² B65H *75/18*
U.S. Cl. 242—72 B **4 Claims**



1. An expandable chuck for rotatably supporting a longitudinal roll having a hollow cylindrical core when inserted in said core and expanded, and being readily inserted in or removed from said core when not expanded, comprising:

a longitudinal shaft; for supporting said chuck

a cylindrical sleeve concentric with said shaft and rotatably mounted on said shaft intermediate the ends thereof;

first and second wheel members concentric with said sleeve and fixedly mounted thereon, said wheel members being spaced apart on said sleeve by a distance less than the length of the core of the roll to be supported;

first and second pneumatically inflatable tube members respectively concentric with said first and second wheel members and fixedly mounted thereon, each of said tube members having an outer circumference measured concentric with the associated wheel member when not inflated which is substantially less than the inner circumference of the core of the roll to be supported so that said chuck can be longitudinally inserted in or removed from said core when not inflated, and each of said tube members expanding radially outward of the associated wheel member to engage the inner surface of the core of the roll to be supported when inserted in said core and pneumatically inflated;

means for pneumatically interconnecting said first and second tube members; and

first and second valve means respectively associated with said first and second tube members and each accessible from the end of said expandable chuck adjacent the associated tube member when said chuck is inserted in the core of a roll to be supported, each of said valve means permitting both of said tube members to be pneumatically inflated in cooperation with said means for pneumatically interconnecting.

3,972,489

TENSION BRUSH WITH ADJUSTABLE BRAKE

Joseph J. Kovaleski, c/o Wyrepak Industries, Inc., 136 James St., Bridgeport, Conn. 06604

Filed May 16, 1975, Ser. No. 578,364
Int. Cl.² B65H *49/00*, *59/00*
U.S. Cl. 242—128 **8 Claims**

1. A take-off device for use in unreeling wire from a spool without excessive looseness or kinking, comprising in combination:

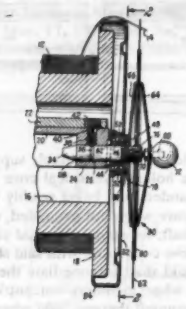
a. a support,

b. means for mounting the support on a free end of a spool containing wire,

c. a take-off wheel rotatably carried by said support, said wheel being coaxial with and adjacent said free end of the spool and extending radially at least to the rim portion of said one spool end, to be engaged and rotated by wire which is unreeled from the spool past said end,

d. a plurality of substantially radially disposed, flexible, slender spoke-like wire-restraining tines fixedly sup-

ported at their inner ends on said support adjacent the axis of said wheel and extending generally radially outward alongside the wheel and past the periphery thereof, the outer end portions of said tines yielding to and being shifted peripherally by the unreeling wire, said wire being thereby restrained from wholly free travel around the periphery of the spool end and being prevented from freely unwinding around the spool end and kinking during slow wire speeds or halting of the wire, and



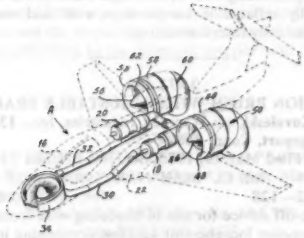
e. cooperable braking means on said support and wheel for imparting a drag force to the latter as it rotates under the action of the wire, said means comprising a ring turnable with the wheel and an adjoining ring fixed with respect to the support, and a common brake washer having a single brake facing engaging said rings simultaneously and further including a manually operable adjustment for varying the magnitude of said drag force in order to enable the wheel speed to be related to differing wire take-off speeds.

3,972,490

TRIFAN POWERED VSTOL AIRCRAFT

Vincent H. Zimmermann, Olivette; Horacio J. deGarcia, Jr., Maryland Heights, and Harlan K. Pierson, Hazelwood, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Mar. 7, 1975, Ser. No. 556,293
Int. Cl.² B64C *15/14, 29/00*
U.S. Cl. 244—12 B **13 Claims**



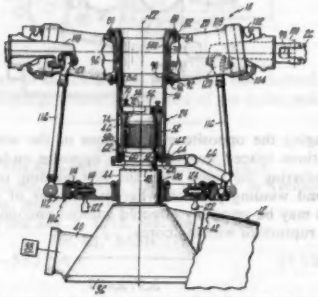
11. An aircraft comprising a fuselage; a fixed wing on said fuslage; and means for discharging downwardly directed airstreams from three locations on the aircraft and with sufficient force to exceed the weight of the aircraft for vertical flight thereof, said airstream discharge means for one of said locations being a fan rotating about an upright axis and being in the fuselage ahead of the center of gravity and the other two airstream discharge means being fans rotating about generally horizontal axes and being disposed externally of and at the sides of the fuselage generally to the rear of the wing, the three locations forming the apexes of a triangle and the center of gravity for the aircraft being within the triangle, whereby a stable tripod is developed for supporting the aircraft, and a pair of gas generating turbine engines carried within said fuselage and connected to each of said airstream discharge means.

3,972,491

TWO-POSITION HELICOPTER MAIN ROTOR

Donald Leroy Ferris, Newtown, and Robert Charles Rybicki, Trumbull, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed July 14, 1975, Ser. No. 595,951
Int. Cl.² B64C *27/06*
U.S. Cl. 244—17.27 **70 Claims**



1. A helicopter having:
A. a fuselage,
B. a main lift rotor including hub and blades,
C. means to support said lift rotor in two positions of elevation about the helicopter fuselage including:
1. a first shaft supported to project upwardly from the helicopter fuselage and to be rotated about an axis of rotation,
2. a second shaft connected at its first end to the first shaft so that its second end is positioned in greater vertical elevation above the fuselage than said first shaft and so that said second shaft is driven in rotation about said axis of rotation by said first shaft, and
3. means connecting said rotor to said second shaft second end for rotation therewith about said axis of rotation and so that said rotor may be disconnected from said second shaft second end and lowered with the blades attached to be connected to said first shaft.

30. The method of moving a helicopter main lift rotor from a first elevated position above the fuselage wherein the rotor is supported from an extension shaft projecting from a first shaft to a second elevated position above the fuselage wherein the rotor is supported from the first shaft comprising the steps of disconnecting the helicopter rotor from the extension shaft, securing the helicopter blades in fixed position with respect to the rotor hub, lowering the rotor with the blade so secured to the elevation of the first shaft, removing the extension shaft, and connecting the rotor to the first shaft.

3,972,492

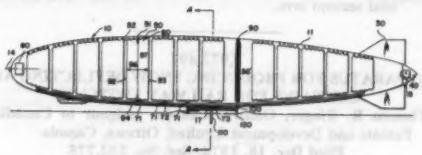
AIRSHIP FOR TRANSPORTING GAS

William G. Milne, 500 Bradie Bldg., 630 6th Ave. SW., Calgary, Alberta, Canada

Filed Jan. 29, 1975, Ser. No. 545,319
Int. Cl.² B64B *1/06*
U.S. Cl. 244—30 **9 Claims**

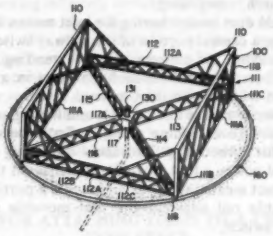
1. A dirigible for transporting a cargo gas comprising:

an elongated body comprising a rigid outer shell;
means for propelling said dirigible in flight;
a plurality of collapsible chambers disposed within said outer shell for holding the cargo gas;
means for slidably supporting said collapsible chambers along the substantially entire periphery thereof;



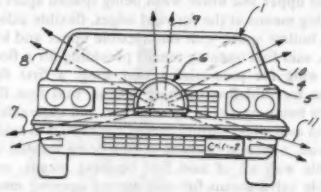
means for loading and unloading the gas, said means including a manifold, a transfer connection in fluid communication with said manifold, and a plurality of chamber connections in fluid communication with said manifold and with corresponding ones of said collapsible chambers; and
means for facilitating the expansion and collapse of said chambers during the gas loading and unloading of said collapsible chambers.

3,972,493
DOCKING DEVICE FOR A DIRIGIBLE
William G. Milne, 500 Bradie Bldg., 630 6th Ave. SW., Calgary, Alberta, Canada (T2P9S8)
Filed Jan. 29, 1975, Ser. No. 545,321
Int. Cl.² B64B *1/66*
U.S. Cl. 244—115 **1 Claim**



1. A docking device for a gas cargo carrying dirigible that has a substantially transverse circular cross section and horizontally extending docking structures mounted on the outside surface of the dirigible in a plane below the central longitudinal axis of the dirigible, and has a loading-unloading gas main depending from the bottom surface of the dirigible centrally located intermediate the ends thereof, said docking device comprising:
a cradle support member for supporting a docked dirigible at only a centrally located portion thereof, said cradle member comprising a webbed frame having a substantially symmetrical base section and a top section with horizontally extending support means conforming to the dirigible docking structures for supporting engagement therewith;
a plurality of support means spaced circumferentially to the bottom of said base section thereby defining a circle for rotatably supporting said cradle support member on a circular track for rotating about a pivot point in a substantially horizontal plane such that a dirigible docked in said cradle member may rotate with said cradle member about said pivot point such that a docked dirigible may be aligned with a prevailing wind direction; and
means for conveying a fluid to the dirigible gas main, said conveying means centrally supported on said cradle support member and comprising a conduit including a rotatable coupling located at said pivot point, and means for placing said conduit into fluid communication with the interior of a dirigible docked in said cradle such that dirigible is free to weathervane with said cradle while a fluid is being conveyed into or out of the interior of said dirigible.

3,972,494
VEHICLE AIR SCREEN APPARATUS
Hilbert F. P. Drews, 5640 S. 76th St., Greendale, Wis. 53219
Filed Aug. 30, 1974, Ser. No. 502,048
Int. Cl.² B64C *1/38*; B63B *1/38*
U.S. Cl. 244—130 **3 Claims**



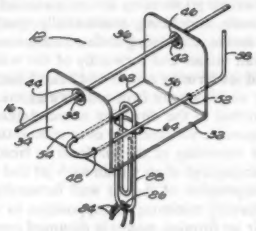
1. In a land vehicle having ground support means for movement over land and adapted to be moved through the atmosphere, said vehicle having a forward wall means moving through and parting the air as the vehicle moves through the atmosphere, an air jet forming means mounted forwardly of such wall means and being substantially smaller than the forward wall means and having orifice means essentially parallel to such wall means and forwardly of the wall means connected to said jet forming means and establishing at least one high velocity air jet screen from said orifice means projected essentially normal to the direction of movement of said wall means and operable substantially over substantially the entire wall area for removing of the air from in front of said wall means by entrainment of air within such jet and thereby minimize the compression of the air wall forwardly of said wall means and thereby minimize the opposition to vehicle movement, said air jet forming means is mounted centrally of such wall means of the vehicle and establishing a plurality of jets projected essentially normal to the direction of movement, said plurality of jets including individual side jets moving in opposite directions and upwardly directed jets.

3. In a vehicle adapted to be moved through the atmosphere, said vehicle having a forward wall means moving through and parting the air as the vehicle moves through the atmosphere, an air jet forming means mounted forwardly of such wall means and having orifice means essentially parallel to such wall means and forwardly of the wall means connected to said jet forming means and establishing at least one high velocity air jet from said orifice means projected essentially normal to the direction of movement of said wall means and operable substantially over the wall area for removing of the air from in front of said wall means and thereby eliminating the compression of the air wall forwardly of said wall means and thereby minimize the opposition to vehicle movement, said vehicle is an aircraft having a forwardly projecting nose portion, said jet forming means secured to the nose portion and establish the air jets forwardly of the aircraft.

3,972,495
AERIAL SLED
Dominn C. Jalbert, 170 NW. 20th, Boca Raton, Fla. 33432
Division of Ser. No. 41,022, May 27, 1970, Pat. No. 3,749,337, which is a continuation-in-part of Ser. No. 867,116, Sept. 30, 1969, abandoned. This application July 30, 1973, Ser. No. 383,629
Int. Cl.² B64D 17/02
U.S. Cl. 244—145 7 Claims

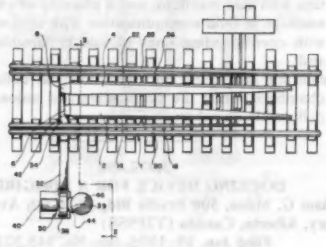
1. An aerial device comprising a flexible wing having upper and lower flexible walls, each wall having a forward edge and rearward edge, said rearward edges of said upper and lower flexible walls forming a wing trailing edge, said forward edges of said upper and lower walls being spaced apart forming first opening means at the forward edges, flexible side walls defining a hollow space with said flexible upper and lower flexible walls, said first opening means providing for a flow of air into said wing for pressurizing said wing, a first flexible valve means for said first opening means, said first flexible valve means being openable by said flow and closeable by air pressure in said wing, shroud means connected to said lower flexible wall, a second opening means being located in said lower flexible wall aft of said first opening means, and a second flexible valve means for said second opening means.

3,972,496
KITE PARACHUTE CARRIER
Gerald D. Novorr, 850 Thayer Ave., Los Angeles, Calif. 90024
Filed Apr. 14, 1975, Ser. No. 567,626
Int. Cl.² A63H 27/08
U.S. Cl. 244—155 R 3 Claims



1. A kite parachute carrier consisting of:
a base having a first and second upstanding arms integral with and formed perpendicular to said base;
a first pair of aligned enclosed apertures formed in each of said arms defining a kite cord guide;
a second pair of aligned apertures formed in each of said arms;
a third aperture formed in only one of said arms;
a slidable release formed of a main rod having a first end and a second end and extendng through said second pair of aligned apertures, an intersecting member connected to said main rod first end for preventing said main rod first end from moving into the area intermediate the upstanding arms;
a releasing rod extending through said third aperture and generally parallel to said main rod and having one end terminated intermediate said upstanding arms and the other end connected to said main rod second end for enabling said main rod and said releasing rod to move jointly; and
a fourth aperture formed in said base, said releasng rod one end being movable from a first position defined by a plane intersecting said base intermediate said base aperture and said first arm to a second position defined by a plane intersecting said base intermediate said base aperture and said second arm.

3,972,497
APPARATUS FOR PRODUCING SNOW DEFLECTING AIR CURTAINS FOR RAILWAY SWITCHES
Thomas R. Ringer, Ottawa, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada
Filed Dec. 18, 1974, Ser. No. 533,775
Int. Cl.² E01B 7/00
U.S. Cl. 246—428 1 Claim



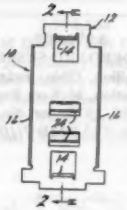
1. Apparatus for producing snow deflecting air curtains for a railway switch, comprising:
a. elongated duct means having air inlet means and extending along a central portion of the railway switch, the duct means having air passage means extending therealong which decreases in cross-sectional area in a lengthwise direction from the air inlet means,
b. a first nozzle means attached to, and having an elongated nozzle orifice extending along, a first side of the duct means for directing a first, snow deflecting air curtain over and across a first movable rail adjacent the first side of the duct means, and over and across a portion of a first immovable rail adjacent the first movable rail, of the railway switch,
c. a second nozzle means attached to, and having an elongated nozzle orifice extending along, a second side of the duct means for directing a second, snow deflecting air curtain over and across a second movable rail, adjacent the second side of the duct means, and over and across a portion of a second immovable rail adjacent the second movable rail, of the railway switch, and
d. air supply means connected to the air inlet means, for continuously supplying pressurized, unheated air, by means of the duct means, to the first and second nozzle means to cause the first and second, snow deflecting air curtains to issue continuously from the elongated nozzle orifices at a velocity of at least one hundred feet per second, and wherein,
e. the first and second nozzle means are inclined upwardly at an angle in the range 4° to 6° to the horizontal in a direction towards the first and second movable rails respectively, so that each of the first and second snow deflecting air curtains will issue from the respective elongated nozzle orifice along a path inclined upwardly at an angle in the range 4° to 6° to the horizontal in a direction towards the respective first and second movable rail over which that snow deflecting air curtain will pass and result in the deposition of snow particles outside the area of the railway switch that is to be protected.

3,972,498

DEVICE FOR ATTACHING ELECTRICAL BOXES TO METAL STUDS

Joseph Henry Paskert, Lakewood, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed July 30, 1975, Ser. No. 600,243
Int. Cl.² H02G 3/12, 3/08; E06B 7/28
U.S. Cl. 248—205 R 7 Claims



1. A mounting device for use in attaching an electrical box to a metal stud having at least one flange having two flange ends and a web in a spaced configuration comprising:

a gripping member having at least one end formed into a gripping means, the gripping means being adapted to grip the two flange ends of said flange;

a clamp having hooks thereon, mounted on the gripping member the hooks engaging the gripping member so as to allow motion of the clamp along the longitudinal axis of the gripping member;

means associated with the gripping member to limit motion of the clamp along the longitudinal axis of the metal stud, said means preventing motion of the clamp in one direction along the longitudinal axis of the gripping member and allowing infinitely variable motion of the clamp in the other direction along the longitudinal axis of the gripping member, the means including at least one projection projecting from the gripping member at an angle thereto so as to contact a portion of the clamp; and

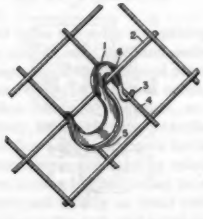
means for securing an electrical outlet box to the clamp, the resulting mounting device allowing movement of the clamp and attached electrical box to position the box relative to dry wall attached to the metal stud.

3,972,499

HANGER FOR ATTACHING ITEMS TO A CHAIN LINK TYPE FENCE

George H. Simmons, 4660 Paradise Drive, Tiburon, Calif. 94920

Filed Oct. 21, 1974, Ser. No. 516,425
Int. Cl.² F16B 45/00
U.S. Cl. 248—224 2 Claims



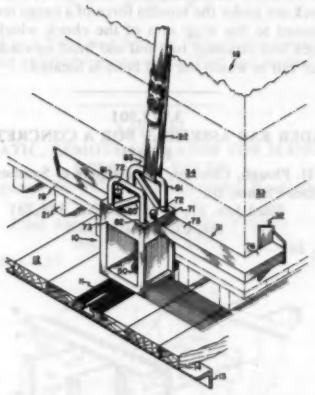
1. A releasable hanger for hooking over and engaging diagonal rod or wire sections, the hanger being of serpentine shape and fabricated with a U-shaped cantilever arm of inverted T cross-sectional construction, blunted at the upper tip, and having an expanded bight for maintaining vertical loads; the rearward portion of the cantilevered arm being extended into a narrow inverted U-shaped, load-bearing hook of T cross-sectional construction, which then extends downward and terminates in a beveled rearward-facing J-shaped hook which has its throat curved to engage the next lower major extension or diagonal wire or rod, said load-bearing look being narrower at the mouth of its U-shape than at the bight of its U-shape, whereby a diagonal rod or wire section may be captured therein.

3,972,500

APPARATUS FOR A CARGO RESTRAINT SYSTEM

J. Algot Johnson, 9 Sheridan Drive, Short Hills, N.J. 07078, and Robert Kennedy, 203 Matoaka Court, Williamsburg, Va. 23185

Filed Nov. 20, 1972, Ser. No. 308,303
Int. Cl. B65j 1/22
U.S. Cl. 248—485 7 Claims



1. A cargo restraint system for cargo carriers adaptable for the restraint of the fastened cargo in the longitudinal, lateral and vertical axes, and which transfers all restraint forces generated by inertia forces of the cargo directly to the floor supports of the cargo carrier, comprising,

a continuous floor rail which is adaptable for fastening to the floor support members of the cargo carrier, said floor rail being formed with a continuous groove along its length open to the upper surface of the floor rail, with said groove extending from the upper surface of the floor rail, and with the upper section of the groove being narrower than the lower section of the groove in the interior portion of the floor rail, and

a load restraint chock which may be fastened to the floor rail at any position along the length of the floor rail, with means to tighten the load restraint chock securely to the floor rail at any position of the floor rail, said load restraint chock being formed with one or more vertical bearing surfaces adaptable to be braced against an exterior vertical surface of the load, together with

a strap arm which is fastened to the load restraint chock, said strap arm being adaptable for fastening to a flexible strap which may be tied about the cargo with

said load restraint chock adaptable to be fastened to the floor rail in fixed engagement with the floor rail by means of a fastener, one end of which is anchored in the undercut section of the groove of the floor rail, with the other end of the fastener being anchored to the load restraint chock such that the said fastener carries all loads, transmitted to the chock from the attached cargo, to the floor and to the floor rail and from thence to the floor supports

of the cargo carrier on which the floor rail is mounted, in which the means to tighten the load restraint chock securely to the floor rail comprises a fastener anchored to the bottom of the chock fixed in non-rotatable engagement with the chock,

said fastener projecting in the shape of a headed rod below the bottom of said chock and terminating in a bolt head which fits into the wider undercut portion of the floor rail groove, with the shank of said headed rod passing freely through the narrow upper section of the floor rail groove, in which

the head of the rod is of an oblong shape such that the maximum width of the head is less than the width of the upper narrow section of the groove in the floor rail, with the length of the head of the said rod being greater than the width of said narrow section of the groove, but the length of the rod head being less than the width of the wider lower section of the groove, with

the interior bearing face of the rod head formed with a sharp projection so as to bite into the mating bearing surface of the floor rail groove when the rod and attached chock are under the tension force of a cargo tension strap fastened to the strap arm of the chock which pulls the chock and attached rod and rod head upwards from the floor rail in which the rod head is located.

3,972,501

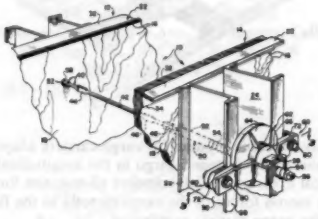
SPREADER BAR ASSEMBLY FOR A CONCRETE WALL FORM

Russell H. Plough, Chicago, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Filed Jan. 27, 1975, Ser. No. 544,281

Int. Cl.² E04G *17/08*

U.S. Cl. 249—42 **4 Claims**



1. In combination with a wall form having opposed panels between which wet concrete is poured in the formation of the wall, said panels having a pair of aligned holes therein, a pair of upstanding, laterally spaced, channel-like strongbacks secured to the outer side of each panel and disposed on opposite sides of the hole therein, said strongbacks having outwardly extending flanges along their outer longitudinal edges, a she-bolt projecting through each of said holes, a tie rod extending across the form and threadedly connected at its ends to the inner ends of the she-bolts, a spreader bar assembly for maintaining each pair of strongbacks substantially erect during concrete-pouring operations, said spreader bar assembly comprising a reaction washer through which the associated she-bolt projects slidably, said washer bridging the distance between the strongbacks annd overhanging the outwardly extending flanges thereon on opposite sides of said she-bolt, a clamping nut threadedly received on the outer end of said she-bolt and engageable with the washer to prevent outward spreading of the adjacent panel during concrete-pouring operations, a pair of clamping blocks disposed rearwardly of and overhanging said outwardly extending flanges, headed studs projecting outwardly from said clamping blocks and passing loosely through openings in the overhanging portions of said reaction washer, and a spreader bar proper having one end thereof pivoted to one of said studs and having an open-ended notch formed in its other end, the medial region of said spreader bar being formed with a laterally offset section which likewise is provided with an open-ended notch, said spreader bar being capable of swinging movement into and out of an operative position wherein the notch in its other end straddles the other headed stud and said laterally offset section encompasses the clamping nut with its notch in straddled relation with the outer end of said she-bolt forwardly of said clamping nut.

3,972,502

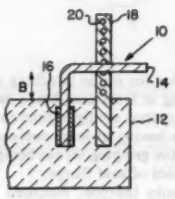
ADJUSTABLE SIDEBOARD SUSPENSION MEANS

John S. Korhel, Vermilion, Ohio, assignor to Metallurgical Exoproducts Corporation, McKees Rocks, Pa.

Filed Jan. 30, 1975, Ser. No. 545,610

Int. Cl.² B22D *7/10*

U.S. Cl. 249—198 **7 Claims**



1. An adjustable suspension system integral with and for suspending a hot top sideboard in an ingot mold comprising:

A. a sleeve member positioned along a vertical axis within the sideboard;

B. a bent rod having a first end positoned within the sleeve member for frictionally slidable, vertical movement therein and a second end extending outward from the sleeve member for positioning on the ingot mold;

C. a strip rigidly secured within the hot top substantially adjacent the bent rod and extending substantially vertically from said hot top; and

D. means to lock the second end of the bent rod to the strip in a fixed position relative to the sideboard.

3,972,503

SERVO PRESSURE OPERATED PISTON ARRANGEMENTS

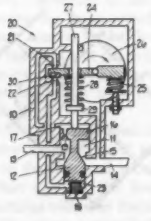
Trevor Stanley Smith, Sutton, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Aug. 19, 1975, Ser. No. 605,929

Claims priority, application United Kingdom, Oct. 31, 1974, 47284/74

Int. Cl.² F16K *31/02*

U.S. Cl. 251—30 **7 Claims**



1. A servo-pressure operated piston arrangement comprising a piston member slidable within a cylinder in response to variations in a servo-pressure signal, a pilot valve for controlling said servo-pressure signal, said pilot valve comprising a

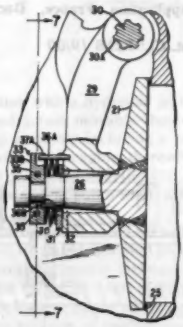
torque motor, a first orifice, a control member movable by said torque motor to vary fluid flow through said first orifice, first biasing means urging said control member against movement by said torque motor, and a second orifice, said second orifice communicating with a chamber defined, in part, by opposing axially - directed faces on said piston member and said cylinder, said first biasing means urging said control member in a direction to shut said second orifice.

3,972,504

MAIN STEAM ISOLATION CHECK VALVE

Roland DiSabatino, Jr., Cherry Hill, N.J.; Henry W. Matthews, Richboro, and Mathew L. Freeman, Newtown, both of Pa., assignors to Ametek, Inc., New York, N.Y.

Filed Dec. 2, 1974, Ser. No. 528,650
Int. Cl.² F16K *15/18*
U.S. Cl. 251—82 **8 Claims**



1. In a valve, the combination including a valve body with an annular valve seat about a passage therethrough, and a disc-shaped valve member pivotally mounted relative to said valve seat, said disc-shaped valve member having a thickness which increases from the peripheral edge thereof toward the center of said valve member, said thickness being such that said disc-shaped valve member can deform as the valve member closes on said seat to absorb impact energy, the valve seat having a softer metal overlay as compared with the material of the valve body and valve member so that the major deformation is in the disc-shaped valve member and in the softer metal overlay of the seat rather than in the body.

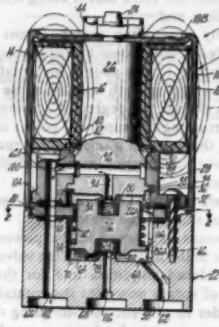
3,972,505

CONTROL VALVE

Lawrence D. Padula, New Britain, Conn., assignor to Skinner Precision Industries, Inc., New Britain, Conn.

Filed Apr. 4, 1975, Ser. No. 565,278
Int. Cl.² F16K *31/06*
U.S. Cl. 251—129 **7 Claims**

1. A fluid control valve assembly comprising a body having a flow passageway and an inlet port and outlet port opening into the flow passageway, a flow control plunger movable in the flow passageway between first and second positions for controlling fluid flow between the ports, an electromagnet supported on the body, the electromagnet including a solenoid coil and a magnetic flux conducting core having a center leg, the coil being in concentric surrounding relation to the core center leg, the core center leg projecting axially beyond the coil toward the body and having an inner end located in remotely spaced relation to the coil, and a coil supporting member concentrically secured around the inner end of the core center leg, the coil supporting member and the core center leg being mutually deformed in a cold formed metal-to-metal sealed joint to prevent unintended leakage of the confined fluid under pressure, the plunger being mounted for reciprocable movement along a path of movement coaxially aligned with the center leg of the core, the inner end of the core center



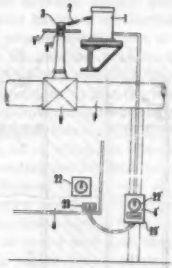
leg serving as a fixed stop limiting plunger movement toward the coil and establishing one of said first and second plunger positions.

3,972,506

AUTOMATIC, REMOTE OPERATOR FOR MANUALLY OPERABLE VALVE

Shojiro Azuma, No. 591-28, Katakura-cho, Hachioji, Tokyo, Japan

Filed Apr. 22, 1975, Ser. No. 570,950
Int. Cl.² F16K *31/04*
U.S. Cl. 251—133 **3 Claims**



1. For a valve having a shaft rotatable through more than 360 degrees for fully opening the valve when it is fully closed and for fully closing the valve when it is fully open, an automated, remote opening and closing unit, comprising:

an electric motor having a rotary output shaft and being provided with a power supply means for providing electrical power for operating the motor to rotate the output shaft of the motor;

rotary power transmission means connecting the rotary output shaft with the rotatable shaft of the valve, so that rotation of the power transmission means in one sense normally opens the valve and rotation of the power transmission means in the opposite sense normally closes the valve;

a degree of openness transmitting means linked to the rotatable shaft of the valve, for normally providing a signal which is interpretable to provide an indication of the extent to which the valve that is being controlled is in an open condition;

a control panel disposed remotely from the valve to be controlled thereby;

the control panel including:

degree of openness receiver for receiving said signal and for providing as an interpretation thereof an indication of the extent to which the valve that is being controlled is in an open condition; and

a power supply controlling switch means linked to the power supply for said motor and operable to provide the supply of power to the motor for rotating the power transmission means in both said one sense and said opposite sense to change the degree of openness of the valve, and for interrupting the supply of power to the motor for maintaining the valve at a selected degree of openness;

the rotary power transmission means including:

a speed reducer;

first endless belt means driving the speed reducer from the rotary output shaft of the motor;

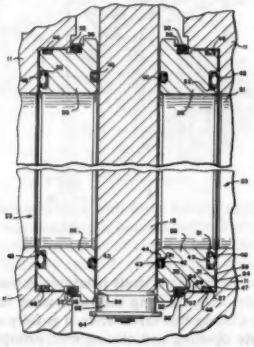
limit switch means interposed in the power supply means and sensitive to the attainment by the valve of a fully open and a fully closed condition and for then interrupting application of rotary power to the rotatable shaft of the valve, in order to prevent over-torquing of the rotatable shaft once an extreme of rotation is reached;

second endless belt means between the speed reducer and the limit switch means and third endless belt means between the degree of openness transmitter, respectively, for coordinately driving the limit switch means and the degree of openness transmitter from the speed reducer.

3,972,507
VALVE CONSTRUCTION

Marvin H. Grove, Houston, Tex., assignor to M & J Valve Company, Houston, Tex.

Filed June 9, 1975, Ser. No. 585,228
Int. Cl.² F16K 25/00
U.S. Cl. 251—172 4 Claims

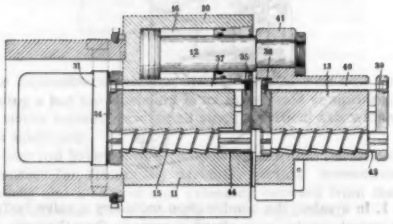


1. In a valve construction, a valve body having aligned openings forming flow passages, a valve member within the body movable between open and closed positions relative to the flow passages, means extending through the upper end of the body for operating the valve member, and sealing means carried by the body and surrounding at least one of the flow passages, the sealing means serving to establish a seal between the body and the valve member for closed position of the valve member, the sealing means comprising a seat ring, an annular recess formed in the body within which the seat ring is slidably accommodated, the recess having a cylindrical surface and a bottom shoulder surface, the ring having an outer cylindrical surface dimensioned to slidably interfit the cylindrical surface of the recess with one end face of the ring disposed adjacent and opposed to the shoulder surface, means forming a seal between said peripheral surfaces, spring means for urging the seat ring toward the valve member, means carried by the seat ring for engaging and forming a seal between the seat ring and the valve member, and a sediment guard interposed between said one end face of the seat ring and the shoulder surface, said guard comprising an annular member of resilient material, the seat ring having an annular recess within which said member is accommodated, the space between the guard and the seal between the cylindrical surfaces being vented to the corresponding flow passage only at the upper portion of the seat ring.

3,972,508
TAKE-UP ACTUATOR

René Beghi, Bois Colombes, France, assignor to Societe des Grands Travaux de Marseille, Nanterre, France

Filed Dec. 16, 1974, Ser. No. 532,926
Claims priority, application France, Dec. 21, 1973, 73.46096
Int. Cl.² F21B 19/00
U.S. Cl. 254—29 A 5 Claims



1. A traction actuator comprising:

a fixed retaining block;

a movable traction block coaxially aligned with said retaining block;

each of said blocks including a set of respective aligned longitudinal bores of substantially the same diameter;

each said bore having slidably mounted therein a key tapering from one end to its other end within its respective bore and at least four individual strands extending through each key;

said bores being spaced circumferentially within said blocks;

a pair of first bearing plates, one of said plates mounted in abutting relation with one end of each of said keys located in said fixed block, and the other of said plates having first means mounted in abutting relation with the other ends of said keys;

a pair of second bearing plates, one of said second plates mounted in abutting relation with one end of each of said keys located in said movable block, and the other of said second plates having second means mounted in abutting relation with the other ends of said keys;

a first plurality of rods extending between said pair of first bearing plates to assemble said bearing plates and said fixed block together so that said included set of tapered keys slides in synchronism; and

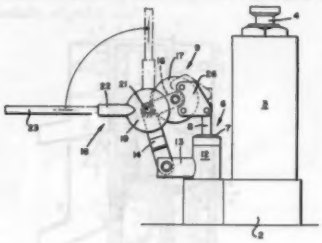
a second plurality of rods extending between said pair of second bearing plates to assemble said second bearing plates and said movable block together so that said included set of tapered keys slides in synchronism.

3,972,509

HYDRAULIC JACK INCORPORATING ROTATABLE POWER TRAIN IN PUMP ASSEMBLY

Philip S. Cancilla, 342 Ann Darling Drive, San Jose, Calif. 95133

Filed Oct. 2, 1975, Ser. No. 618,963
Int. Cl.² B66F 3/24
U.S. Cl. 254—93 H 9 Claims



1. In combination with a hydraulic jack structure having a main cylinder and a ram movable therewithin by hydraulic fluid and a pump assembly including a pump cylinder and a pump shaft axially displaceable therewithin to pump fluid from within said pump cylinder into said main cylinder by axial displacement of said pump shaft, a pump handle assembly, comprising:

a. link means pivotally mounted on said jack structure;

b. a drive pinion rotatably mounted on said link and including handle receiving means thereon;

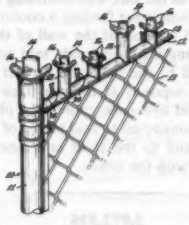
c. pressure plate means pivotally mounted on said link and engaged by said drive pinion so that rotation of said drive pinion effects rotation of said pressure plate means one portion of said pressure plate means being pivotally connected to said pump shaft to effect axial displacement thereof when said pressure plate means is caused to rotate.

3,972,510

MULTI-BLADED UPRIGHT FOR A FENCE

Duayne D. Dougherty, 6807 N. 39th Ave., Phoenix, Ariz. 85019

Filed June 24, 1974, Ser. No. 482,647
Int. Cl.² E04H 17/14
U.S. Cl. 256—11 1 Claim



1. A multi-bladed upright for use on the top of a fence structure comprising:

a. a metallic tubular body mountable adjacent the top of the fence so as to protrude upwardly therefrom;

b. a plurality of knife-edge segments at the upper end of said body, each of said segments outwardly flared with respect to said body so as to extend radially angularly upwardly therefrom; and

c. a multi-bladed sleeve concentrically mounted on said tubular body, said sleeve axially slidable on said body and rotatable about the axis thereof, said sleeve having a plurality of upwardly outwardly flared knife-edge segments at the top thereof and a plurality of outwardly depending knife-edge segments at the bottom thereof.

3,972,511

RODS FOR ERECTING WIRE FENCES

Hector Alberto Balestrini, Peru 283, Buenos Aires, Argentina

Filed May 1, 1974, Ser. No. 465,932
Claims priority, application Argentina, May 3, 1973, 247818
Int. Cl.² B27F 21/00
U.S. Cl. 256—47 1 Claim

1. A rod for erecting a wire fence of the kind wherein several wire lines extend between upright posts, comprising a length of hardened wire having a substantially linear median portion and first and second end portions at upper and lower ends respectively of the median portion, the end portions extending at right angles to the median portion in substantially opposite respective directions so that the median portion and said end portions are substantially coplanar, and the wire being deformed at several locations to form open, substantially C-shaped loops, all of which are open towards the same side of the plane of median portion and the end portions, two of said loops being formed respectively at the junction between the median portion and the first end portion and at that end of the first end portion which is further from the median portion for gripping an upper wire line, the first end portion being deformed at a region intermediate its ends to bear against said upper wire line, two of said loops being formed respectively at the junction between the median portion and the second end portion and at that end of the second end portion which is further from the median portion for gripping a lower wire line, the second end portion being deformed at a region intermediate its ends to bear against said lower wire line, and at least one further loop being formed in the median portion for gripping an intermediate wire line.

3,972,512

MIXING MATERIALS IN CONTAINERS

Frederick G. J. Grisé, 130 Hesperus Ave., Magnolia, Mass. 01932, and Walter Lovell, 348 Mountain Road, Wilbraham, Mass. 01095

Division of Ser. No. 399,862, Sept. 24, 1973, Pat. No. 3,862,748. This application Dec. 19, 1974, Ser. No. 534,623
Int. Cl.² B01F 7/30
U.S. Cl. 259—102 2 Claims

1. The method of mixing material in a closed container comprising advancing a generally straight single element needle having a sharpened end portion at an incline relative thereto piercing through a re-piercable and reclosing elasto-

meric diaphragm on a wall of the container, and then by rotating the needle, forming a pumping action on the material

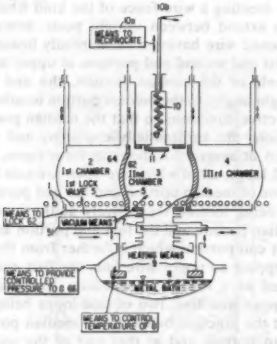
throughout the container between top and bottom of the container while it is completely closed.

3,972,513

METHOD AND APPARATUS FOR TREATING AND ANNEALING FERROUS AND NON-FERROUS ARTICLES

Hans Eberhard Möbius, Michael-Tritz-Str. 4, D-6622 Wadgassen, and Sorayapour Soraya, Kurt-Schumacher-Allee 84, D-663 Saarlouis, both of Germany

Filed Aug. 7, 1974, Ser. No. 495,423
Claims priority, application Germany, Mar. 1, 1974, 2409818
Int. Cl.² C21D 1/26, 9/00
U.S. Cl. 266—130 29 Claims



1. An apparatus for rapid batchwise heating and/or annealing ferrous and non-ferrous materials in piece form comprising:

at least one air-tight furnace chamber;

means to introduce said material into said airtight furnace chamber;

means to evacuate said airtight furnace chamber while containing said material to a vacuum up to 1×10^{-2} mmHg;

means to subject said material in said chamber to boiling metal vapors at a pressure between about 0.1 atmosphere to 5 atmospheres;

a first valve means to withdraw the condensate formed on said material;

and to close off said means to subject said material to vapor, from the said chamber; and

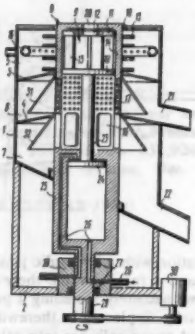
means to cool said chamber.

3,972,514

CENTRIFUGE FOR THE REFINING OF NONFERROUS METALS

Bogdan Vyacheslavovich Voitsekhovsky, ulitsa Maltseva, kottedzh 2, and Anatoly Vladimirovich Dolgov, Morskoi prospekt, 36, kv. 30, both of Novosibirsk, U.S.S.R.

Filed July 2, 1975, Ser. No. 592,777
Int. Cl.² C22B 9/02
U.S. Cl. 266—204 2 Claims



1. A centrifuge for the refining of nonferrous metals comprising: a base frame; a hollow housing mounted on said base; an end face of said hollow housing wherein a loading port is provided for; a side wall of said hollow housing provided wherein are ports for the separate discharging of the metal refined and the solid impurities; annular transverse partitions attached to the side wall of said housing on the inside and subdividing the space inside the housing into annular chambers; a hollow bowl disposed in said hollow housing; an end face of said hollow housing provided with a loading port; a side wall of said hollow bowl provided with ports for the separate discharging of the metal refined and the impurities through the respective annular chambers and the ports in the side wall of said hollow housing; a hollow pusher disposed in said hollow bowl and provided with a solid end face linked up with the end face wherein a loading port is provided for by means of radial partitions; a solid portion of the wall of said bowl contiguous to the loading port of said wall and extending to a height correspondng to the height of said hollow pusher, said portion serving as the side wall confining the space inside said pusher; a contrivance for feeding a coolant to the outside surface of said solid portion of the wall of the hollow bowl, said contrivance being installed inside said hollow housing; a rotary motor geared to the end face of said hollow bowl; a hydraulic cylinder disposed at the end face of said hollow bowl; a piston of said hydraulic cylinder; a piston rod of said hydraulic cylinder connected to said piston of hydraulic cylinder with one end and to the solid end face of said hollow pusher of the bowl with the other.

3,972,515

LANCE FOR STEEL SMELTING

Robert Mercatoris, Luxembourg, Luxemburg, assignor to Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED, Luxembourg, Luxemburg

Filed Apr. 4, 1975, Ser. No. 565,113
Claims priority, application Luxemburg, Apr. 5, 1974, 69797
Int. Cl.² C21C 5/42
U.S. Cl. 266—225 3 Claims

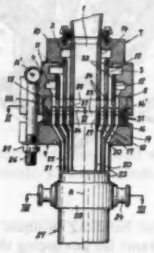
1. An assembly for mounting a blowing lance for a metallurgical installation upon a support structure, comprising:

a fluid supply head member fixed to said structure and formed with a plurality of fluid passages;

a plurality of fluid-carrying conduits permanently secured to said head member and respectively communicating with said passages;

a connecting member fixed to said lance and formed with a plurality of passages communicating with corresponding ducts of said lance;

clamping means for securing said members in axial alignment and for drawing same together when said members are axially aligned; and



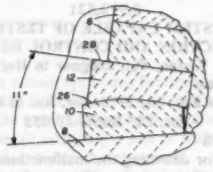
respective rigid orifice plates on each of said members provided with orifices respectively communicating with the passages of their respective members, and concentric annular ridges separating the orifices of the respective passages from one another, the annular ridges of said orifice plates registering with each other upon axial alignment of said members for sealingly engaging the annular ridges of an opposing orifice plate when said members are drawn together, one of said members being formed as a socket receiving said orifice plates and said one of said members and the respective orifice plate defining an aligning formation engageably by a complementary formation of the other orifice plate.

3,972,516

SHAPES FOR USE IN LINING METALLURGICAL VESSELS

Nicholas Napora, Pittsburgh, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed June 23, 1975, Ser. No. 589,504
Int. Cl.² C21C 5/44
U.S. Cl. 266—283 **10 Claims**



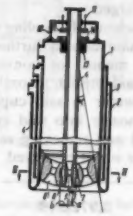
8. A pair of refractory shapes suitable for use in metallurgical vessels consisting essentially of an upper shape and a lower shape, each shape having opposed upper and lower surfaces, side surfaces and end surfaces, the upper surface of the upper shape being relatively flat and the lower surface being concavely curved, the upper surface of the lower shape being convexly curved and the lower surface being relatively flat, said shapes being mated at the convexly curved and concavely curved surfaces, the end surfaces of each of said shapes being respectively convexly curved and concavely curved.

3,972,517

TUYERE FOR INTRODUCING REACTANTS INTO A BATH OF MOLTEN METAL

Fedor Vladimirovich Kraizinger, prospekt Metallurgov, 219, kv. 70; Vitaly Vasilievich Pogoretsky, ulitsa Pushkina, 66; Dmitry Apelovich Tarpinian, prospekt Stroitelei, 110, kv. 57; Valery Petrovich Popov, ulitsa Stepnaya, 2, kv. 71, all of Zhdanov, Donetskoi oblasti; Alexandr Alexeevich Perimov, B. Filevskaya ulitsa, 41, korpus 3, kv. 30, and Vladimir Pavlovich Glinkin, ulitsa Verkhnaya Maslovka, 8, kv. 43, both of Moscow, all of U.S.S.R.

Filed Aug. 5, 1974, Ser. No. 494,924
Int. Cl.² C21C 7/00
U.S. Cl. 266—225 **4 Claims**



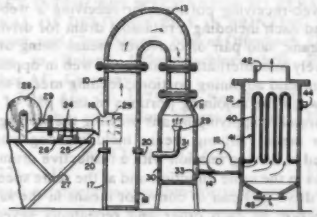
1. A tuyere for introducing reactants into a bath of molten metal comprising: an elongated water-cooled tubular casing for admitting a flow of a gaseous reactant through its bore; a movable pipe disposed coaxially in said casing with provision for axial displacement and serving to admit a flow of another reactant through its bore; means for making possible the axial displacement of said pipe; a stopper disposed at the outlet of said casing and fixed to said movable pipe so that the external circumferential surface of said stopper mates with the internal circumferential surface of said casing at the area where said stopper is fitted assuring the setting of said stopper into its working position with an interference fit, the withdrawal of said stopper from its working position for occasional replacement being accomplished by moving said movable pipe along its axial direction; and nozzles being provided in said stopper for admitting the flows of reactants.

3,972,518

CUPOLA EMISSION CONTROL SYSTEM

Thomas C. Sunter, Allentown, Pa., assignor to Fuller Company, Catasauqua, Pa.

Filed Nov. 23, 1973, Ser. No. 418,705
Int. Cl.² C21C 1/06
U.S. Cl. 266—147 **1 Claim**



1. An improved apparatus for conditioning the gases of combustion in a cupola having elongated sidewalls, a charge door and a gas discharge, said improved apparatus comprising:

a first conditioning means in said cupola for oxidizing the gases of combustion;

a second conditioning means in said cupola including a first means for selectively supplying cooling water through said charge door for cooling the gases discharged from said cupola when charging of said cupola is discontinued;

a third conditioning means flow connected to said cupola by a first conduit means, said third conditioning means including a vessel having a second means for selectively cooling with water the gases discharged from said cupola;

a fourth conditioning means flow connected to said third conditioning means by a second conduit means, said fourth conditioning means including means for separating and collecting particulate material from the gases discharged from said cupola having sufficient capacity to separate the particulate material from the gas while said cupola is being charged

said first means for selectively cooling with water the gases discharged from said cupola further includes movably mounted conduit means for conveying cooling water from a source to said cupola, a nozzle means for dispersing said cooling water in said cupola, and means for introducing said nozzle into said cupola while cooling water is conveyed and removing said nozzle from said cupola while water is not conveyed.

3,972,519

APPARATUS FOR THE ZIG-ZAG FOLDING OF A WEB OF MATERIAL

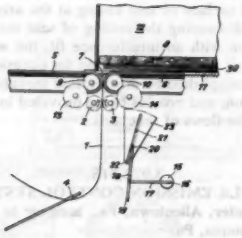
Roland Metzer, Schwelm, Germany, assignor to R. Metzer oHG Machinenbau und Metallverarbeitung, Schwelm, Germany

Filed Jan. 17, 1975, Ser. No. 541,927

Claims priority, application Germany, Jan. 17, 1974, 2402027

Int. Cl.² B65H *29/46*

U.S. Cl. 270—30 5 Claims



1. Web folding apparatus for producing a zig-zag folded stack, comprising: a pair of adjacent endless transverse web conveyor means for conveying a web and having adjoining and spaced web-receiving portions for receiving a web therebetween and each including a rotatable drum for driving a conveyor means, said pair of conveyor means being oriented to respectively and alternately convey the web in opposite directions from said adjoining portions; feeding means to feed the web between the adjoining portions of said pair of conveyor means; pressure applying means pressing the web against said conveyor means; driving means including cog wheels each connected in driving relation with a respective drum to rotate the drums in the same direction and at the same speed as each other to drive said pair of conveyor means in the same speed and direction as each other and repeatedly reversing said direction of both said conveyor means; a rack meshing with the cog wheels to coordinate the speed and direction of revolution of the drums; and a receptacle for the folded stack and secured to the rack for movement to and fro therewith as the cog wheels revolve; whereby a zig-zag folded stack is produced.

3,972,520

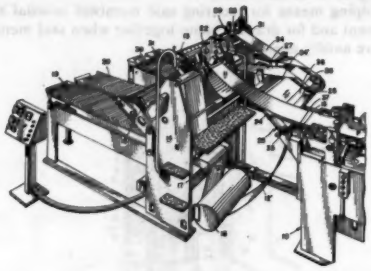
APPARATUS FOR HANDLING BUSINESS FORMS

Jerry L. McKeefry, Pulaski, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Aug. 15, 1975, Ser. No. 605,147

Int. Cl.² B65H *41/00*

U.S. Cl. 270—52.5 3 Claims



1. In apparatus for handling business forms, a frame, pin belt means on said frame for advancing along a predetermined linear path at least three superposed continuous business form webs for processing the same, said webs thereby including an uppermost web and at least a pair of webs therebelow,

a first folder on said frame linearly aligned with said path and spaced therefrom in the direction of web travel adapted to receive said uppermost web and fold the same,

a compound turning bar on said frame in the space between said path and said first folder adapted to receive said pair of said webs and direct the same laterally into a second path generally perpendicularly to the first-mentioned path, said compound turning bar including an elongated inner member extending at an angle to said first-mentioned path and having a generally arcuate periphery when viewed in cross section and an outer member fixed to said inner member but spaced therefrom and having an outer arcuate periphery extending over only a portion of the arcuate periphery of said inner member to provide a leading edge adapted to deleave said pair of webs prior to turning thereof,

a turning bar means on said frame in said second path for turning said pair of webs into third and fourth paths generally parallel to said first-mentioned path, and

a pair of folders on said frame, one in each of said third and fourth paths each adapted to receive one of said pair of webs.

3,972,521

BINDERY SYSTEM CAPABLE OF TESTING ITS OWN INSPECTION AND CONTROL DEVICES

David A. Reed, Easton, Pa., assignor to Harris Corporation, Cleveland, Ohio

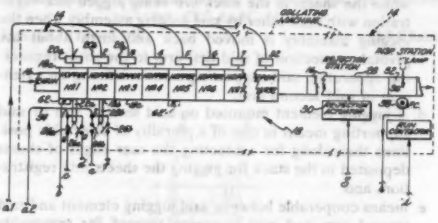
Filed Feb. 28, 1975, Ser. No. 554,154

Int. Cl.² B65H *39/055*

U.S. Cl. 270—58 13 Claims

1. A system for detecting the malfunctioning of sensors in a bindery system for producing a book composed of a plurality of signatures and comprising a gatherer conveyor and means for delivering a book component comprising at least a portion of a book to said conveyor, control means for enabling delivery of said book component by said delivery means, a sensor responsive to delivery of said book component and providing an output indicative of whether or not said book component was delivered and producing a fault indication when said book component is not delivered in response to enabling by said control means, test means connected for selectively providing an intentional test command signal for commanding a fault of said delivery means such that said book component is not

delivered when said control means enables delivery, comparator means for comparing the output of said sensor to the output of said test means for providing a signal upon said



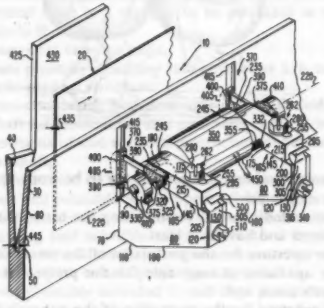
sensor failing to properly indicate a fault when said test means commands a fault whereby said signal indicates a malfunctioning of said sensor.

3,972,522

DOCUMENT VIEW STATION

Harry L. Wallace, Garden City, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sept. 2, 1975, Ser. No. 609,222
Int. Cl.² B65H *29/20*
U.S. Cl. 271—64 **38 Claims**



1. A document station apparatus for interceptibly removing selected documents from a flow of documents for purposes of viewing and tactile manipulation, said apparatus comprising:

a. guideway means including a pair of walls for channeling the flow of documents therebetween;

b. power means for providing rotational energy along the axis of said power means;

c. a pair of frame means disposed on one of the pair of walls of said guideway means for operatively supporting said power means; and

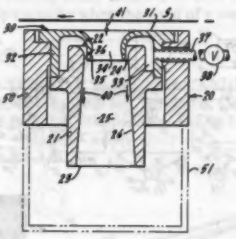
d. camming means radially disposed along the axis of said power means and traversing one of the pair of walls of said guideway means for frictionally engaging the selected documents in said guideway means and for applying sufficient holding pressure on the selected document as backed by the other of the pair of walls of said guideway means to arcably cam the selected document up and out of said guideway means.

3,972,523

SHEET BRAKE FOR PRINTING PRESS DELIVERY

Harry Brandes, Jugesheim, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Offenbach, Germany

Filed Oct. 30, 1975, Ser. No. 627,053
Claims priority, application Germany, Nov. 13, 1974, 2453753
Int. Cl.² B65H *29/68*
U.S. Cl. 271—183 **8 Claims**



1. In a delivery arrangement including a conveyor chain with grippers for feeding sheets seriatim to the delivery of a printing press and for releasing sheets above the delivery pile, the combination including a jet type vacuum pump facing and closely spaced to the path of a passing sheet for braking the forward movement of the sheet so that it settles vertically on the pile, the vacuum pump including a venturi nozzle having an inlet end and a discharge end, the venturi nozzle having a presented edge defining a narrowed throat at the inlet and a central space having a wall which merges with the throat and flares outwardly to the discharge end of the nozzle, an injector member having a central opening registered over the inlet end of the venturi nozzle and axially spaced therefrom, the central opening being surrounded by a lip which overhangs the inlet end of the venturi nozzle and which defines with the inlet end a restricted annular orifice adjacent the throat of the nozzle, means defining an annular chamber surrounding the inlet end of the venturi nozzle and communicating with the annular orifice, means for feeding air under pressure to the annular chamber so that an annular jet of air flows through the annular orifice along the wall of the throat and along the flaring wall of the central space to create suction at the throat by venturi action, the suction causing induction of ambient air through the central opening to produce a drag upon the passing sheet, and an air conduit at the discharge end of the venturi nozzle for discharging the air vented from the nozzle at a point remote from the passing sheet.

3,972,524

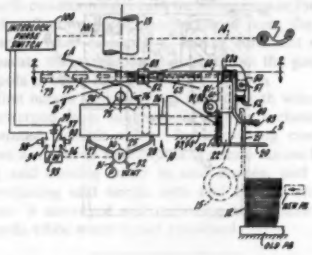
SHEET INTERCEPT MECHANISM TO PERMIT REMOVAL OF DELIVERY PILE IN PRINTING PRESS

Janko Despot, and Claus Simeth, both of Offenbach, Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany

Filed Aug. 20, 1975, Ser. No. 606,083
Claims priority, application Germany, Aug. 29, 1974, 2441459
Int. Cl.² B65H *31/32*
U.S. Cl. 271—218 **12 Claims**

7. A sheet intercept mechanism for temporarily retaining sheets released by take-off grippers above a delivery pile at the output of a sheet fed printing press comprising in combination a horizontal supporting member, a clamping member vertically movable thereon, a horizontal actuator coupled to the supporting member for advancing it forwardly from a retracted position clear of the pile into a sheet-receiving position above the edge of the pile, the clamping member being in normally open condition having means for relatively closing

the members for clamping the edge of a sheet between them, means for energizing the actuator for forward movement into sheet-receiving position, triggering means coupled to the take-off grippers for operation thereby phased with release of a dropped sheet for triggering the closing means so that the clamping member clamps the edge of the dropped sheet to the supporting member for intercepting the dropped sheet as well as the sheets subsequently dropped, thereby to permit the pile to be removed and a new pile board inserted in the place thereof, the triggering means having disabling means for disabling the triggering means when the horizontal support member is in its retracted position and for enabling the triggering means when the supporting member is in its sheet receiving position, means for subsequently energizing the horizontal actuator for movement of the supporting member back into retracted position, means operated incident to retraction of the supporting member for releasing the intercepted sheets so that the sheets are deposited on the pile board to begin a new pile, and means for restoring the clamping member to its normal open position in readiness for an ensuing interception cycle.

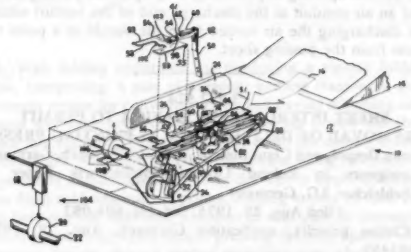


3,972,525

SHEET JOGGING ASSEMBLY

Dean Harold Foster, Stratford, and William Adamoski, Jr., Stamford, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Feb. 18, 1975, Ser. No. 550,870
Int. Cl.² B65H 31/38
U.S. Cl. 271—221 **6 Claims**



1. A sheet jogging assembly for use in sheet registration apparatus in which sheets deposited in a stack are jogged into registration with each other prior to an operation being performed on the registered stack, said jogging assembly comprising:

a. a first generally vertically oriented arm having means on the lower end thereof for pivotally mounting said arm on a portion of the sheet registering apparatus in a position such that the jogging assembly is in operative association with a stack of sheets in the sheet registering apparatus,

b. a second arm pivotally connected to one end thereof to the upper end of said first arm and disposed generally perpendicularly to said first arm,

c. means pivotally connected to the other end of said second arm for supporting the rear portion of a stack of sheets while the sheets in the stack are being jogged into registration with each other by said jogging assembly when the jogging assembly is moved back and forth about the pivotal connection of said first arm to the sheet registering apparatus, said supporting means defining an extension of said second arm,

d. a jogging element mounted on said second arm or said supporting means in one of a plurality of selectable positions therealong for contacting the rear edges of sheets deposited in the stack for jogging the sheets into registration, and

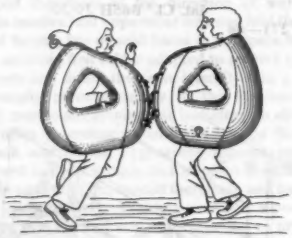
e. means cooperable between said jogging element and said second arm and said extension thereof for removably mounting said jogging finger in any one of said plurality of positions whereby said jogging assembly jogs sheets of different length depending on the position of said jogging element along said plurality of selectable positions.

3,972,526

INFLATABLE BODY BALLOON

James F. Cox, Jr., 904 William St., River Forest, Ill. 60305

Filed Oct. 7, 1974, Ser. No. 512,525
Int. Cl.² A63B 7/12
U.S. Cl. 272—1 D **3 Claims**



1. A recreational and amusement toy to be worn upon the human form, comprising

a double-walled garment for investing the torso of the human form and having at least

an upper aperture for the protrusion of the wearer's head,

armhole apertures at each side for the protrusion of the wearer's arms, and

a lower aperture for the protrusion of the wearer's legs,

the walls of the garment being assembled by sealing together a plurality of gores of flexible, air-impervious sheet material to constitute an inflatable closed chamber for encasing the torso of the wearer while permitting the head, arms, and legs of the wearer to protrude through said apertures,

and a closable vent in at least one of the walls for inflating the toy,

said gores being shaped and proportioned such that said toy when inflated and worn provides a bulbous, pneumatic collision cushion of toroidal outline with the interior thereof forming an enclosure for the torso of the wearer,

said cushion having a maximum thickness at least equal to the minimum diameter of said enclosure,

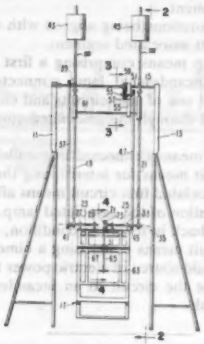
said gores being of such a size and shape in the vicinity of said armhole apertures that when said cushion is fully inflated, the thickness of said cushion around said armhole apertures is approximately equal to said minimum diameter of said enclosure so as to permit the retraction of the arms alongside the torso of the wearer and substantially within the outline of the inflated toy.

3,972,527

PASSENGER POWERED ROTATING AMUSEMENT RIDE

Karl W. Bacon, Mountain View, Calif., assignor to Arrow Development Co., Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 525,831, Nov. 21, 1974, abandoned. This application Oct. 16, 1975, Ser. No. 623,146
Int. Cl.² A63G 1/12
U.S. Cl. 272—33 R 10 Claims



1. A passenger powered amusement ride, comprising:
a fixed support frame having a horizontal shaft suspended in air with an unobstructed space there-beneath,
a movable support structure pivotally mounted to said horizontal shaft in a manner to be pivotable in a complete circle thereabout,
a passenger carrying cage,
means pivotally mounting said cage at an axis to said movable support structure,
means connecting said passenger cage with said horizontal shaft for maintaining said passenger cage horizontal at all positions of said supporting structure about said horizontal shaft,
a rod mounted on said passenger cage coincident with said axis and rotatable with respect to said cage,
means connecting said rod with said horizontal shaft for causing said movable support structure to rotate about the horizontal shaft in response to rotation of said rod with respect to said passenger cage, and
a lever pivotably mounted to said cage in a manner permitting a passenger therein to move said lever back and forth about said lever pivot, said lever pivot being displaced on said cage a distance from said axis,
means carried by said passenger cage and operably interconnecting to said rod with said lever for translating said back and forth motion of the lever to rotatable motion of said rod, whereby said movable support structure is caused to rotate in response to passenger motion and power applied to said lever.

3,972,528

BASEBALL BAT GRIP

Leonard Dean McCracken, Arlington Heights, and Thomas John Wallace, Crystal Lake, both of Ill., assignors to Pepsico Inc., Purchase, N.Y.

Filed Feb. 14, 1975, Ser. No. 550,123
Int. Cl.² A63B 59/06
U.S. Cl. 273—72 A 8 Claims

3. A device having a handle, and a friction grip for said handle which comprises an integral coating on said handle composed of a synthetic rubber, a tackifier, a stabilizer, an anti-slip material, and a defoamer, said coating being resilient, tacky, having an open pore surface and a high coefficient of

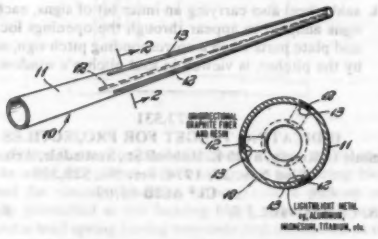
friction and said coating being sensitive to heat and moisture to increase its grip capacity when the hand of a user perspires.

3,972,529

REINFORCED TUBULAR MATERIALS AND PROCESS

Walter F. McNeil, 221 Ridge Road, Stratford, Conn. 06497

Filed Oct. 7, 1974, Ser. No. 512,917
Int. Cl.² A63B 53/12
U.S. Cl. 273—80 B 8 Claims



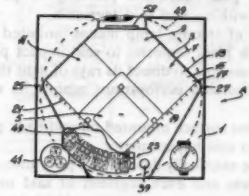
1. A reinforced metallic element having increased strength and stiffness comprising a thin-walled, hollow, tubular elongate metallic body having a first predetermined specific gravity and a plurality of circumferentially spaced longitudinal slots thereabout, each of said slots containing a continuous strip of unidirectional graphite fiber composition bonded therein to fill said slot and be flush with the outer surface of said metallic body, each of said strips being of a second predetermined specific gravity less than said first specific gravity of said metallic body whereby the weight of said metallic element is less than that which would result had said element been constructed solely of metal of said first predetermined specific gravity.

3,972,530

BOARD BASEBALL GAME

Walter R. F. Dohn, 210 Champagne Drive, Baie d'Urfe, Quebec, Canada

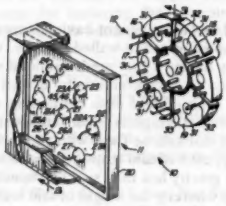
Filed Mar. 7, 1975, Ser. No. 556,320
Int. Cl.² A63F 7/06
U.S. Cl. 273—88 8 Claims



1. A baseball game to be played by two teams comprising:
a. a game board;
b. a baseball diamond drawn over said game board;

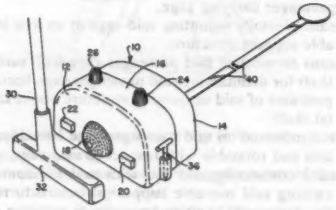
c. said baseball diamond comprising an infield and an outfield;
d. said infield comprising a first base, a second base, a third base, a pitcher's mound, a plate subdivided into nine equal parts having a first visual configuration and two adjacent parts having a second visual configuration, each of said parts formed with an opening therethrough, a batter's box on both sides of said plate, and a catcher's position located behind the plate;
e. said outfield comprising a right field, a left field and a center field;
f. a pitcher's window formed in said game board past the center field;
g. an upstanding screen placed between said window and said center field to conceal said pitcher's window from a player of an opposite team located behind said plate;
h. a wheel rotatably mounted underneath said game board;
i. said wheel carrying an outer ring of various types of pitch signs;
j. said various types of pitch signs individually appearing through said pitcher's window upon rotation of said wheel; and
k. said wheel also carrying an inner set of signs, each set of signs adapted to appear through the openings located in said plate parts when a corresponding pitch sign, selected by the pitcher, is viewed in said pitcher's window.

3,972,531
INDICATING TARGET FOR PROJECTILES
Jimmie L. Knapp, 8128 E. Hubbell St., Scottsdale, Ariz. 85257
Filed Nov. 29, 1974, Ser. No. 528,329
Int. Cl.[2] A63B *65/02*
U.S. Cl. 273—102.2 R **4 Claims**



1. A target impenetratable to the projectiles used for automatically registering the position of the projectile impact comprising in combination:
a sectionalized impact plate consisting of a plurality of interfitting flush translucent segments which are separated from each other and movable independently of each other,
a back plate arranged substantially coextensive with the sectionalized impact plate,
said back plate having a plurality of perforations one aligned with each of said segments,
a plurality of electric lamp means mounted on the side of said back plate opposite to said impact plate with lamp means mounted to direct its rays of light through a different one of said perforations against its associated segment,
a conductive surface mounted on said back plate juxtapositioned to said impact plate,
at least one elastically deformable post interconnecting said back plate and each segment of said impact plate for suspending said segment from said back plate a predetermined distance therefrom,
at least one conductive member mounted on each of said segments and extending laterally thereof toward said back plate,
a conductive member of each segment and said conductive surface being electrically connected in series to form a plurality of parallelly arranged circuits, each circuit energizing a different one of said lamp means across a source of electric power,
said segments of said impact plate being spaced from said back plate a distance such that upon impact of a projectile against one of said segments of said impact plate the conductive member associated with said one of said segments engages said back plate to complete an electric circuit through its associated lamp means thereby illuminating this segment,
each of said perforations being aligned with approximately the center of its associated segment,
each of said lamp means comprising a first circuit means including an incandescent lamp connected in parallel with a different one of said circuits and energized by the flow of current through the associated conductive member, and
a second circuit means connected in parallel with each of said first circuit means for interrupting the current flow through its associated first circuit means after a predetermined energization of the associated lamp, thereby placing the target back in its initial condition,
said second circuit means comprising a bimetallic element in series with said source of electric power to sequentially open and close the circuit to an incandescent lamp to cause it to blink.

3,972,532
PUTTING PRACTICE DEVICE
David N. Bradley, 10430 105th Drive, Sun City, Ariz. 85351
Filed Dec. 3, 1975, Ser. No. 637,386
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—183 C **6 Claims**



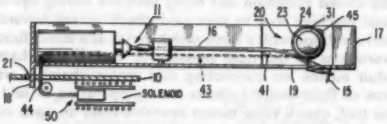
1. A putting practice device comprising:
a support;
a simulated golf ball mounted for limited movement on said support between operative and operated positions;
spring means biasing said ball outwardly toward operative position;
right and left putter contactors mounted on said support on opposite sides of said ball, said contactors being equally spaced from the ball and being spaced apart a distance less than the length of the putting face of a conventional golf putter, the foremost portion of each contactor lying on a line parallel to the face of the support and inwardly of the support from the outermost surface of the ball;
right and left visual signaling means each associated with a respective contactor and mounted on the support to be viewed from above;
and electrical energizing means on said support and including a circuit connected so that a putter stroking said ball from operative position toward operated position and also striking a contactor will cause the associated signaling means to be activated.

3,972,533

SIGNAL PICKUP LIFTING/LOWERING APPARATUS

Larry Dean Huff, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,470
Int. Cl.² G11B 3/10
U.S. Cl. 274—23 R 3 Claims



1. A disc record player for recovering prerecorded signals from a disc record comprising the combination of:

A. a turntable for rotatably supporting a disc record;

B. a pickup arm;

C. a signal pickup mounted at one end of said pickup arm;

D. a pickup arm housing said pickup arm being pivoted at the end thereof remote from said one end within said pickup arm housing for rotation about a first axis parallel to said turntable;

E. a stator fixedly mounted in said pickup arm housing and having a mating surface;

F. a rotor also having a mating surface;

G. means for mounting said rotor in said pickup arm housing for rotation about a second axis which is spaced from said pickup arm axis such that said stator and said rotor mating surfaces are juxtaposed;

H. a thin deposit of damping material interposed between said juxtaposed mating surfaces;

I. a pickup arm rest secured to said rotor for engaging said pickup arm in a region thereof remote from said pivoted end of said pickup arm;

J. actuating means including a movable member which is mounted for motion between a first location and a second location;

K. means for coupling said movable member to said rotor; said movable member establishing a first rotational position for said rotor that causes said arm rest to hold said pickup arm in an elevated position relative to said turntable when said movable member is in said first location; said movable member freeing said rotor for rotation away from said first rotational position when said movable member is in said second location; and

L. means for biasing said damped mating surfaces of said stator and said rotor toward each other; said biasing means also serving to bias said rotor in a direction that causes said arm rest to lower said pickup arm toward said turntable, in order to effect a smooth landing of said signal pickup on a disc record for playback, when said rotor is freed;

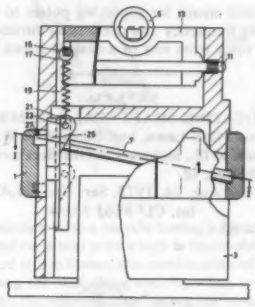
wherein said biasing of said rotor and the location of said engaging region of said pickup arm relative to said arm rest is such as to cause continuation of the rotation of said rotor after said signal pickup engages said disc record to move said arm rest away from said pickup arm when said rotor is freed.

3,972,534

DEVICE FOR CONTINUOUS ADJUSTMENT OF THE STYLUS PRESSURE

Joachim Tetzner, Berlin, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 8, 1975, Ser. No. 575,579
Claims priority, application Germany, May 18, 1974, 2424279
Int. Cl.² G11B 3/22, 3/26
U.S. Cl. 274—23 R 3 Claims



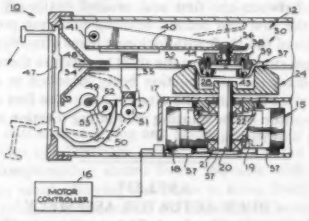
1. A device for continuous adjustment of the vertical stylus force in a record player which comprises a bearing block mounted for rotation about a vertical axis, a pick-up arm pivotally journalled in the bearing block about a horizontal axis, and a load spring having two ends and connected at one end to said pick-up arm for adjusting the vertical stylus force, wherein said device comprises an adjusting ring mounted on said bearing block for rotation about a vertical ring axis, said ring having an inner wall; a carrier slidably mounted in said bearing block for movement parallel to said vertical axis, said carrier being connected to the other end of the tension spring; and spiral means for interconnecting said carrier and said ring such that rotation of said ring moves said carrier axially thereby changing force exerted by said load spring, said ring being movable in rotation only about said ring axis while in a mounted condition.

3,972,535

SPINDLE DRIVE MOTOR

Lewis William Bleiman, Northridge, Calif., assignor to Pertec Corporation, Chatsworth, Calif.

Filed Nov. 8, 1974, Ser. No. 522,220
Int. Cl.² G11B 03/60; H02K 37/00
U.S. Cl. 274—39 A 7 Claims



3. A system for driving a flexible magnetic disk of the type which has a central opening and is contained within a cartridge said comprising:

a motor including a stator and a rotor mounted concentrically about a common axis;

said rotor comprising a cylinder of ferromagnetic material having uniformly spaced teeth formed along the periphery thereof and a drive shaft fixed thereto extending along said common axis;

bearing means supporting said rotor for rotational movement about said common axis;

a hub mounted directly on the end of said drive shaft remote from said rotor;

clamping means for selectively clamping the portion of a disk around the central opening thereof against said hub; and

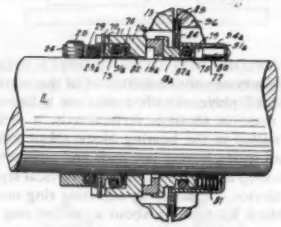
motor control means for supplying pulses to said motor of increasing frequency and decreasing duration to accelerate said rotor from rest to a desired speed.

3,972,536

ROTATING SHAFT SEAL ASSEMBLY

Dale J. Warner, Oak Lawn, and Edward C. Wahl, Arlington Heights, both of Ill., assignors to Gits Brothers Manufacturing Co., Chicago, Ill.

Filed Apr. 24, 1975, Ser. No. 571,438
Int. Cl.² F16J 15/34
U.S. Cl. 277—83 **7 Claims**



1. A mechanical shaft seal comprising a stationary seal assembly and a rotating seal assembly, the stationary seal assembly having first and second stationary seal ring portions received around a shaft with a spring means interposed therebetween urging the second stationary seal ring portion away from the first stationary seal ring portion and towards the rotating seal assembly, the rotating seal assembly including first and second rotating seal ring portions with spring means therebetween constantly urging the second rotating seal ring portion away from the first rotating seal ring portion and towards the stationary seal assembly, a primary seal at an interface between the second rotating seal ring portion and the second stationary seal ring portion, secondary seals between the first and second rotating seal ring portions and the first and second stationary seal ring portions, means limiting rotation between the first and second rotating seal ring portions and between the first and second stationary seal ring portions, the first and second rotating seal ring portions received around the shaft with locking means attaching the first rotating seal ring portion to the shaft to rotation therewith, the first stationary seal ring portion being attached to a housing which receives the shaft, the attachment of the first stationary seal ring portion of the housing preventing rotation of the first stationary seal ring portion.

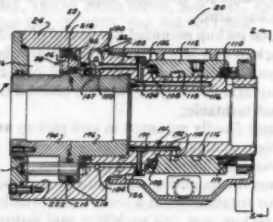
3,972,537

CHUCK ACTUATOR ASSEMBLY

Alex J. McClelland, Cleveland, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Jan. 9, 1975, Ser. No. 539,620
Int. Cl.² B23B 31/12
U.S. Cl. 279—4 **5 Claims**

1. A machine tool for performing operations on a workpiece, said machine tool comprising chuck means for gripping the workpiece during operation of said machine tool, said chuck means being operable between an open condition in which said chuck means is ineffective to grip the workpiece and a closed condition in which said chuck means is effective to grip the workpiece, motor means operable under the influence of fluid pressure to effect operation of said chuck means from the open condition to the closed condition and to apply forces to said chuck means to maintain said chuck means in the closed condition during operation of said machine tool, said motor means including a motor piston and a motor cylinder which at least partially define a motor chamber, said motor piston and cylinder being relatively movable under the influence of fluid pressure forces in said motor chamber to effect operation of said chuck means from the open condition to the closed condition and being effective during operation of said machine tool to urge said chuck means toward the closed condition with a force which varies as a direct function of variations in the fluid pressure in said motor chamber, conduit means for connecting said motor chamber with a source of fluid under pressure during operation of said machine tool, check valve means operable from an open condition to a closed condition in response to a reduction in the fluid pressure in said conduit means during operation of said machine tool to prevent the discharge of a large quantity of fluid from said motor chamber, said check valve means being ineffective to prevent the loss of a small quantity of fluid from said motor chamber upon operation of said check valve means from the open condition to the closed condition, and force maintaining means disposed within said motor cylinder for maintaining the forces urging said chuck means toward the closed condition substantially constant upon operation of said



check valve means from the open condition to the closed condition, said force maintaining means including compensator means mounted on said motor piston for maintaining the fluid pressure in said motor chamber substantially constant by compensating for said loss of a small quantity of fluid upon operation of said check valve means from the open condition to the closed condition, said compensator means including surface means disposed on said motor piston for at least partially defining a compensator cylinder having an open end portion which is directly exposed to the fluid pressure in said motor chamber, a compensator piston disposed on said motor piston within said compensator cylinder and movable relative to said motor piston between a first position in which the open end portion of said compensator cylinder has a first volume and a second position in which the open end portion of said compensator cylinder has a second volume which is larger than said first volume, and spring means disposed on said motor piston within said compensator cylinder for urging said compensator piston toward said first position, said compensator piston being movable from said first position to said second position against the urging of said spring means under the influence of fluid pressure conducted from said motor chamber to said compensator cylinder upon operation of said chuck means from the open condition to the closed condition, said compensator piston being movable from said second position toward said first position under the influence of said spring means upon operation of said check valve means from the open condition to the closed condition to effect a flow of a small quantity of fluid from said compensator cylinder to said

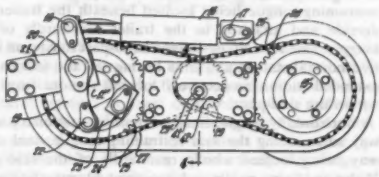
motor chamber upon operation of said check valve means from the open condition to the closed condition.

3,972,538

VEHICLE STEERING MECHANISM

Stephen A. Breame, Wednesfield, England, assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 3, 1975, Ser. No. 546,364
Claims priority, application United Kingdom, Feb. 9, 1974, 6014/74
Int. Cl.² B62D 3/02
U.S. Cl. 280—93 2 Claims



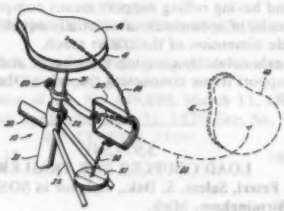
1. In a vehicle steering system comprising first and second ground engageable wheels supported for rotation about substantially horizontal axes; means mounting said wheels to said vehicle for angular displacement about respectively first and second substantially vertical axes spaced apart on said vehicle; and means interconnecting said wheels for simultaneous differential angular displacement about said vertical axes, said interconnecting means comprising a first sprocket wheel angularly displaceable about said first vertical axis with said first wheel, a second sprocket wheel angularly displaceable about said second vertical axis with said second wheel, a first transfer sprocket mounted to said vehicle between said first and second vertical axes for angular displacement about an eccentric vertical axis and for translation in a substantially horizontal plane, an endless chain interconnecting said first sprocket wheel and said first transfer sprocket for simultaneous angular displacement, a second transfer sprocket mounted to said vehicle between said first and second vertical axes about an eccentric vertical axis and for translation in a substantially horizontal plane, an endless chain interconnecting said second sprocket wheel and said second transfer sprocket for simultaneous angular displacement, and means coupling said first and second transfer sprockets together for simultaneous rotation and translation; the improvement comprising: chain tension adjustment means comprising a first arcuate guide member disposed between said first sprocket wheel and said first transfer sprocket and bearing against said first transfer sprocket, adjustable means acting on said first guide member urging said first transfer sprocket in a direction tending to increase the distance between said first sprocket wheel and said first transfer sprocket, a second arcuate guide member disposed between said second sprocket wheel and said second transfer sprocket and bearing against said second transfer sprocket, adjustable means acting on said second guide member urging said second transfer sprocket in a direction tending to increase the distance between said second sprocket wheel and said second transfer member, said means coupling said first and second transfer sprockets comprising a coupling assembly permitting relative lateral movement of the eccentric axes of said first and second transfer sprockets.

3,972,539

BICYCLE SEAT COVERING AND RECEPTACLE THEREFOR

Timothy I. Mize, 150 NE. 12th St., Moore, Okla. 73160

Filed Sept. 22, 1975, Ser. No. 615,765
Int. Cl.² B62J 19/00
U.S. Cl. 280—289 S 4 Claims



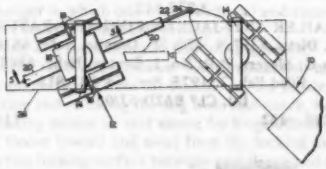
1. In combination with a bicycle having a frame, and having a seat mounted on a seat post which is removably and adjustably connected to the frame, the combination of a seat covering, for keeping the seat clean and dry when not in use, and a receptacle for the seat covering having the covering received bodily therein when not in use, the seat covering being formed of flexible non-elastic water proof sheet material and shaped to conform to the contour of the seat, and having elastic means acting on the material of the covering to gather it, along its peripheral edge, to secure the covering in engagement with the seat, the material of the covering being such that it may be rolled or folded, for storage in small space, and the receptacle consisting of a cylindrical container, open at one end and having a screw cap therefor, which is rigidly and removably connected to the bicycle structure which includes the seat post and the frame, as described, and positioned rearwardly of the seat and below it, with its open end facing rearwardly for convenient access to its interior.

3,972,540

ANTI-LOAD STRIPPING AND SAFETY ATTACHMENT FOR LOGGING TRUCK-TRAILER COMBINATIONS

Jack D. Donaldson, 134 Beville Road, Chehalis, Wash. 98532

Filed Aug. 18, 1975, Ser. No. 605,280
Int. Cl.² B62D 53/00
U.S. Cl. 280—404 14 Claims



1. An anti-load stripping and safety attachment for logging truck-trailer combinations, provided with a trailer reach, and sliding compensation means freely movable with respect to the trailer reach allowing the trailer to move freely longitudinally in relation to the truck, the attachment comprising;

A. expanding friction brake means configured to fit within the trailer reach,

B. positioning means locating the expanding friciton brake means for releasable, frictional, braking contact with the inner walls of the trailer reach,

C. connecting means joining the expanding friction brake means to the sliding compensation means, and

D. brake operating means connected to the expanding friction brake means for operation thereof and operable from a remote station.

14. An anti-load stripping and safety attachment for logging truck-trailer combinations provided with a trailer reach, a compensator shaft coupled to the truck and telescoping in freely sliding relation into the trailer reach allowing the trailer to move freely longitudinally in relation to the truck, expanding friction brake means configured to fit within the trailer reach, and having rolling support means comprising;

A. wheels, of a diameter substantially equal to the vertical inside dimension of the trailer reach,

B. an axle rotatably carrying the wheels, and

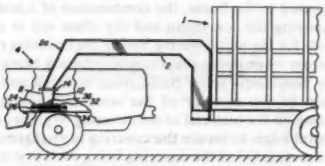
C. a support frame connecting the axle to the compensator shaft.

3,972,541

LOAD COUPLER FOR TRAILERS

Leon G. Feterl, Salem, S. Dak., assignor to SOS Consolidated, Inc., Birmingham, Mich.

Filed May 14, 1975, Ser. No. 577,559
Int. Cl.² B60D 1/00
U.S. Cl. 280—423 R 17 Claims



1. A trailer hitch for coupling a trailer drawbar to the bed of a towing vehicle comprising:

an elongated, gooseneck shaped drawbar affixed to the front end of a trailer;

generally vertically extending coupling arm means attached to the forward end of said drawbar;

a horizontally positioned ring member rotatably supported on base means affixed to the rear bed of a towing vehicle;

an elongated, rigid, coupling bar extending horizontally across said ring member and affixed thereto; and

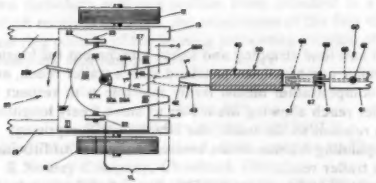
means on said coupling arm means restrainably and pivotally engaged with said coupling bar in releasable, coupling connection therewith, for relative pivotal movement between said coupling arm means and said bar about the horizontal axis defined by said coupling bar.

3,972,542

TRAILER ANTI-JACKKNIFING APPARATUS

Arthur A. Dirks, 5357 N. 47th St., Omaha, Nebr. 68104, and William G. Meyers, R.R. No. 1, Gretna, Nebr. 68028

Filed Feb. 7, 1975, Ser. No. 547,818
Int. Cl.² B62D 53/06
U.S. Cl. 280—432 11 Claims



1. Trailer anti-jackknifing apparatus in combination with conventional tractor-drawn trailer wherein the tractor includes a forwardly disposed operator's cab and a rearwardly disposed fifth wheel assembly unit having a substantially horizontal skid-plate, the skid-plate comprising a generally circular forward major portion and a pair of longitudinally horizontally extending guide-lugs having rearwardly divergent inward-sides and terminating at transversely opposed rear-tips to provide an elongate angular V-slot including said lineal inward-sides forwardly converging for a longitudinal finite-length from the rear-tips to a secureable kingpin extending along the tractor-to-trailer vertical pivot-axis, the trailer longitudinally extending horizontal underside including a frontal base-plate carrying a said depending upright kingpin and the trailer underside also extending longitudinally lengthily rearwardly from and in pivotably associated relationship with the tractor through said kingpin vertical-axis, said anti-jackknifing apparatus comprising:

A. A generally horizontal longitudinally extending elongate restraining-tongue terminating as a monolithic forward head-part having a permanently fixed angular taper equal in angular value to that of the skid-plate V-slot, said restraining-tongue being located beneath the trailer underside and attached to the trailer rearwardly of the kingpin, said restraining-tongue head-part having an inactive normal-station and also having an anti-jackknifing extended-station respectively located remote from and within the skid-plate V-slot;

B. A horizontally longitudinally extending stationary slideway surrounding the said restraining-tongue, said slideway being located wholly rearwardly of the skid-plate V-slot and being rigidly and non-pivotably attached to the trailer underside; and

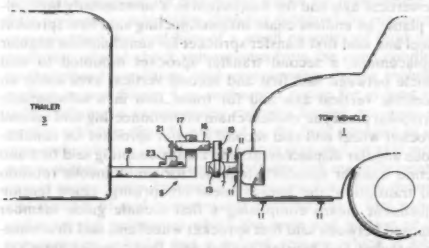
C. Actuation means for causing the restraining-tongue forward monolithic head-part to reciprocate between said normal-station and said extended-station, said restraining-tongue actuation means including a control means located within the tractor operator's cab and hence forwardly remote from the fifth wheel unit skid-plate.

3,972,543

COMBINATION VEHICLE YAW STABILIZER

Rex Wallace Presley, Livonia; Walter Frederick Datwyler, Jr., Royal Oak, and Jack Richardson Lorraine, Howell, all of Mich., assignors to The Bendix Corporation, South Bend, Ind.

Filed Dec. 6, 1974, Ser. No. 530,331
Int. Cl.² B60T 7/20
U.S. Cl. 280—446 B 3 Claims



1. Apparatus for automatically eliminating a sway condition in a trailer vehicle towed by a tow vehicle and having brakes for retarding its rate of movement and having brake operating means with manual means for providing signals to the brake operating means for operating the brakes of the trailer vehicle, comprising a hitch connecting the trailer vehicle to the tow vehicle, sensing means on the hitch for providing signals corresponding to hitch lateral forces, and means connected to the sensing means and to the manual means for combining the hitch lateral force signals with the manual signals to increase the braking force on at least one wheel of the trailer vehicle for automatically eliminating a sway condition.

3,972,544

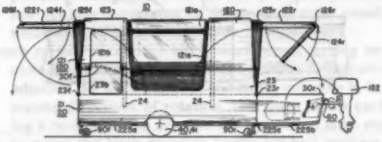
AMPHIBIOUS CAMPER INCLUDING A RETRACTABLE SUSPENSION SYSTEM

Olaf Soot, 9 Tomahawk Lane, Greenwich, Conn. 06830

Continuation-in-part of Ser. No. 394,199, Sept. 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 379,234, July 16, 1973, abandoned. This application June 21, 1974, Ser. No. 481,656

Int. Cl.[2] B63C *13/00*

U.S. Cl. 280—704 22 Claims



1. An amphibious multi-sectional structure comprising: a base section shell structure having upper and lower stiffening members tied together by floor and side members providing structural rigidity; at least one end section shell structure associated with said base section, each such end section having upper and lower stiffening members tied together by floor and side members providing structural rigidity; hinge means pivotably connecting respective upper corner portions of said upper stiffening members of said base section to adjacent corner portions of the upper stiffening members of each such end section, said hinge means defining horizontal axes which are perpendicular to the structure's longitudinal direction; each such end section being rotatable over and onto said base section to provide a compact folded configuration, and each such end section being rotatable away from said base section to provide an elongated unfolded configuration; means for detachably interlocking each such end section's lower stiffening members with said base section's lower stiffening members when in the unfolded configuration; suspension means for transporting said structure permanently mounted on opposite sides of said base section, and means permanently mounted on said base section for selectively lowering and raising said entire base section with respect to said suspension means.

3,972,545

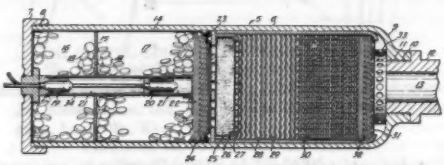
MULTI-LEVEL COOL GAS GENERATOR

George F. Kirchoff, Brigham City, and Fred E. Schneiter, North Ogden, both of Utah, assignors to Thiokol Corporation, Newtown, Pa.

Filed Mar. 10, 1975, Ser. No. 557,204

Int. Cl.[2] B60R *21/08*

U.S. Cl. 280—735 7 Claims



1. In a gas generator for delivering gas to an inflatable structure in response to a sensor, said generator including a housing having an outlet orifice in communication with said inflatable structure, a gas generant material in said housing, and filtering and cooling means between said gas generant material and said orifice, the improvement comprising: a consumable partition dividing said gas generant material into first and second portions; a first electric-initiated igniter adjacent said first portion for igniting it in response to any signal from said sensor; a second electric-initiated igniter adjacent said second portion for igniting it in response to only a high-level signal from said sensor, said second igniter extending through said partition from said second portion into said first portion, whereby said second igniter may be ignited either simultaneously with said first igniter in response to said high-level signal, or sequentially, with respect to said first igniter, by the heat of combustion from said first portion.

3,972,546

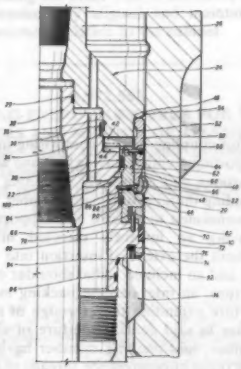
LOCKING ASSEMBLY AND A SEAL ASSEMBLY FOR A WELL

Samuel W. Putch, Houston, Tex., assignor to Norman A. Nelson, Houston, Tex., a part interest

Continuation of Ser. No. 449,698, March 11, 1974, abandoned. This application July 11, 1975, Ser. No. 595,242

Int. Cl.[2] F16L *35/00*

U.S. Cl. 285—18 18 Claims



1. A seal assembly for sealing between a wellhead and a casing hanger in which one of the wellhead and casing hanger includes a locking notch comprising,

a locking dog for locking in said locking notch,

a locking sleeve positioned for longitudinal movement toward and away from the backside of the locking dog for locking and releasing the dog from said notch, said sleeve including means on said sleeve for longitudinally moving the sleeve toward and away from the locking dog,

a coacting locking surface between said sleeve and said dog,

a first member telescopically positioned relative to said sleeve and including non-threaded engaging means for imparting rotation to said first member,

limited longitudinal lost motion means connected between the first member and the sleeve which allows rotation between the first member and the sleeve,

a second member,

one of the first and second members having a shoulder abutting the bottom of the locking dog,

seal means positioned adjacent one of the members for sealing against the wellhead, and

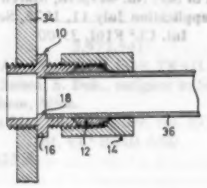
a left-handed threaded connection between the first and second members whereby right-hand rotation of the first member sets said seal.

3,972,547

LOCKING AND NONSEAL JOINT DEVICE

Kunio Itoya, Tokyo, Japan, assignor to Zenzo Ono, Tokyo, Japan

Filed Nov. 21, 1974, Ser. No. 525,765
Int. Cl.² F16L 19/06
U.S. Cl. 285—341 5 Claims



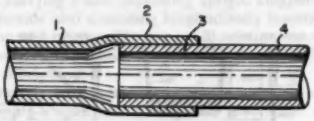
1. A conduit coupling device comprising in combination: a conduit-supporting member having first and second externally threaded portions and a laterally extending flange therebetween protruding therebeyond, said member having a central aperture dimensioned to receive and support a conduit, said member having an inwardly directed internal shoulder adapted to limit the extent of insertion into said member of said conduit and an inclined radial shoulder extending to said central aperture; an intermediate packing member having a central aperture extending therethrough of substantially the same diameter as said central aperture of said conduit-supporting member, said packing member having on at least a portion of its outer circumference threads of substantially the same diameter and pitch as the threads on at least one of said threaded portions of said conduit-supporting member, both ends of said packing member having an inclined surface, a first of said inclined surfaces being complementary to and adapted to coact with the inclined radial shoulder of said conduit-supporting member upon assembly of the device; and a locking member having a first section provided with a central through aperture of substantially the same diameter as that of the central aperture of said conduit-supporting member and said packing member and a second section threaded internally with a thread diameter and pitch adapted to cooperate with the threads of said packing member and the threads on said one portion of said conduit-supporting member, said first and second sections of said locking member being connected internally by an inclined surface extending between said internal thread and said central aperture; which is engageable upon assembly with said packing member and conduit-supporting member with the other of said inclined surfaces of said packing member; said locking member, packing member and conduit-supporting members being positionable such that with their central apertures in alignment said locking member is threadable onto both of said conduit-supporting and packing members so as to impart longitudinal and inwardly directed radial forces on said packing member at both ends thereof whereby substantially the entire internal surface of said packing member engges the external surface of the conduit to thereby lock said conduit against longitudinal movement and simultaneously seal the joint formed between said conduit and coupling against leakage of fluid from said conduit.

3,972,548

METHOD OF JOINING COMPONENTS MADE OF CROSS-LINKED POLYMERS

Rutger Arvid Roseen, Nykoping, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed Nov. 20, 1974, Ser. No. 525,562
Claims priority, application Sweden, Nov. 27, 1973, 7316031
Int. Cl.² F16L 47/00
U.S. Cl. 285—381 27 Claims



1. A method of joining at least two components made of cross-linked polymers that possess a memory effect and are heat expandable or heat shrinkable, the first of said components being a tube and the second having an opening into which an end of the tube can be inserted, the original size of said opening being no greater than the original external size of said tube end, comprising the steps of

a. adjusting at least one of said original sizes so as to enable insertion of the tube end into said opening, whereby at least one of said components is imparted with the memory effect;

b. inserting said tube end into said opening to form a joint location;

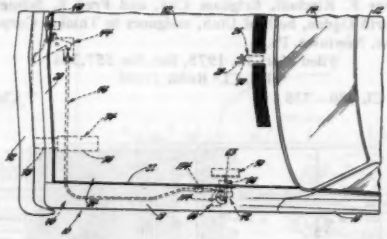
c. heating said joint location to a temperature, which as a result of the memory effect causes said components to return to their original sizes and to form a joint and to fuse together over said joint.

3,972,549

AUXILIARY LATCH SYSTEM FOR A VEHICLE COMPARTMENT PANEL

Victor D. Valade, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 25, 1974, Ser. No. 509,277
Int. Cl.² E05C 1/06; B60K 27/00
U.S. Cl. 292—182 2 Claims



1. In a vehicle including an energy absorbing bumper movable from an extended position to a retracted position with respect to the vehicle to absorb energy upon impact with an obstacle, a pair of laterally spaced front fender structures having their forward ends connected by a laterally extending cross panel and cooperating to define a compartment opening of the vehicle, a compartment panel movable between open and closed positions with respect to the compartment opening of the vehicle, and a primary latch mechanism for latching the compartment panel in closed position and being selectively unlatched to allow opening movement of the panel, the improvement comprising:

first and second secondary latch mechanisms respectively acting between one of the fender structures and the compartment panel at the rearward end of the fender structures opposite the laterally extending cross panel,

each of said secondary latch mechanisms having a latch member movably mounted on the vehicle fender structure adjacent the compartment opening and being movable between a latched position in which the latch member engages the compartment panel to latch the panel in closed position and assist the primary latch mechanism in maintaining the panel in closed position and an unlatched position disengaged from the compartment panel to permit opening movement of the compartment panel upon unlatching of the primary latch mechanism;

each of said secondary latch mechanisms having an associated latch lever pivoted to the vehicle fender structure adjacent the latch member and being movable in first and second directions of rotation, said latch levers each having a portion which engages the associated latch member to move the latch member to the latched position upon pivoting of the latch lever in one direction of rotation;

an actuating lever having an intermediate portion between opposite ends thereof pivotally mounted on the vehicle adjacent the cross panel and the energy absorbing bumper and having one end thereof engaging the energy absorbing bumper so that the actuating lever is pivoted in one direction relative the vehicle upon energy absorbing bumper movement in response to impact of an obstacle;

first and second flexible cable assemblies connecting the latch levers of the respective first and second secondary latch mechanisms with the actuating lever, each of said cable assemblies including an elongated flexible sheath having one end attached to the vehicle adjacent the pivotal mount of the actuating lever and the other end attached to the fender structure adjacent the latch lever, the first and second flexible cable assemblies each also having an elongated flexible cable slidably received within the sheath and having one end attached to the respective latch lever, the other ends of said cables being attached to the opposite ends of the actuating lever so that pivoting movement of the actuating lever in the one direction by movement of the energy absorbing bumper causes pivoting of the latch levers in one direction to move the associated latch members to the latching position to effect latching of the secondary latch mechanisms to assist the primary latch mechanism in holding the closure panel in closed position when an obstacle is impacted;

and said first and second flexible cable assemblies flexing when impact with an obstacle causes collapse of the bumper and cross panel so that the latch members of the secondary latch mechanism are maintained in the latched positions.

3,972,550
ALIGNING-SECURING APPARATUS FOR A REFRIGERATOR DOOR

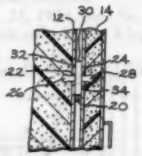
Stephen G. Boughton, Louisville, Ky., and James D. Wilkerson, Jr., Bloomington, Ind., assignors to General Electric Company, Louisville, Ky.

Filed Feb. 12, 1975, Ser. No. 549,178
Int. Cl.[2] E05B *65/52, 65/06*
U.S. Cl. 292—288 **4 Claims**

1. Apparatus comprising:

a household refrigerator having a cabinet and a door, said cabinet and door having openings positioned at preselected locations relative one to the other in the aligned position of the door on the refrigerator cabinet;

an aligning-securing element for aligning and for maintaining said door in alignment during shipping of said refrigerator, said aligning-securing element having a flange and first and second holding elements, said first holding element extending outwardly from a first surface of the flange and being of a size sufficient for insertion into and for being frictionally, releasably maintained in the opening of the cabinet with said first flange surface abutting the outer wall of the cabinet, and said second holding element extending outwardly from an opposed second

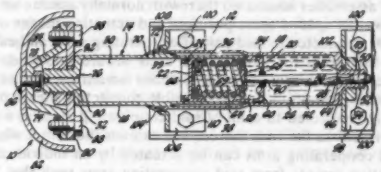


surface of the flange and being of a size sufficient for insertion into and for being frictionally, releasably maintained in the opening of the door with said second flange surface abutting the inner wall of the door, whereby the door is preselectively aligned and maintained against vertical movement relative to the cabinet.

3,972,551
TELESCOPING ENERGY ABSORBER FOR VEHICLE BUMPERS AND METHOD OF ASSEMBLY

Wayne V. Fannin, Xenia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 4, 1975, Ser. No. 583,550
Int. Cl.[2] B60R *19/06*
U.S. Cl. 293—85 **4 Claims**



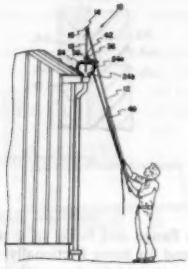
1. An energy absorber unit for yieldably supporting a vehicle bumper to support structure comprising an elongated piston tube, a cylinder tube, means mounting said piston tube for telescopic movement within said cylinder tube, a floating piston mounted for axial movement in said piston tube, a cap mounted on the end of said piston tube and separating said piston tube and said cylinder tube into first and second chambers, an orifice in said cap, an oil filling each of said chambers, a helical extension spring mounted in said first chamber, means connecting one end of said extension spring to said floating piston, a metering pin extending from the end of said cylinder tube through said orifice in said cap to a terminal end in said first chamber, means connecting the other end of said extension spring to said terminal end of said metering pin, said metering pin providing means for restricting said orifice as said unit is telescopically collapsed to absorb energy imparted to said unit, said floating piston being movable in said unit in response to collapse of said unit to expand said helical spring which provides a load on the oil contained in said chambers for returning said unit to an extended position when said impact load is removed.

3,972,552

GUTTER CLEANER

James Wiley Earp, Jr., 6816 Justice Drive, Raleigh, N.C. 27609

Filed Mar. 3, 1975, Ser. No. 555,066
Int. Cl.² B25J 1/02; E04D 13/06
U.S. Cl. 294—19 R 6 Claims



1. A hand-held gutter cleaner for removing leaves and other debris from a gutter, said gutter cleaner comprising: an elongated handle; a pair of cooperating arms pivotably mounted about a common axis about one end of said elongated handle; a tine assembly secured to a remote end of each cooperating arm, and including a plurality of tines projecting generally inwardly therefrom; a guide frame assembly having a pair of spaced apart parallel extending guide members disposed on each side of said pair of cooperating arms and defining an opening therebetween for enabling said arms to move therethrough; means for biasing said pair of cooperating arms outwardly relative to each other such that said arms and the tine assemblies associated therewith normally assume an open outwardly spaced apart position; and actuating means operatively connected to said pair of cooperating arms and extending therefrom for moving said arms inwardly towards each other and closing said tine assemblies toward each other, said actuating means including a flexible connecting means operatively connected to each of said cooperating arms at a point intermediate the ends thereof and extends therefrom whereby said cooperating arms can be actuated by an individual at a location remote from said cooperating arms such that when placed within a gutter said tine assemblies upon actuating move inwardly toward each other and in so doing, leaves and other debris are accumulated and held therebetween, thereby allowing the leaves and other debris to be cleaned and removed from the gutter.

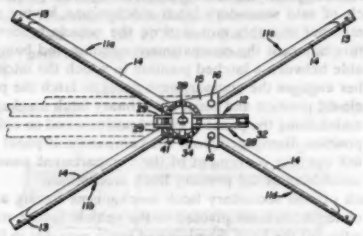
3,972,553

COLLAPSIBLE LIFT FRAME HAVING MEANS TO ADJUST POINT OF LIFT

Clifford V. Johnston, Hebron, Ohio, assignor to Cardinal Industries Incorporated, Columbus, Ohio

Filed Nov. 14, 1975, Ser. No. 631,932
Int. Cl.² B66C 1/10
U.S. Cl. 294—67 DA 4 Claims

1. A foldable lift frame comprising:
a. a generally vertically arranged column;
b. a plurality of load-suspending arms extending laterally outwardly from and pivotally connected to said column for swinging movement in a substantially horizontal plane, said arms being movable from relatively compactly folded, inactive positions to extended, outwardly spread positions of use;
c. means engageable with said arms for holding them in their outwardly spread positions of use; and
d. hoist connection means carried by said column and providing a point of lift for said frame and a load suspended therefrom.

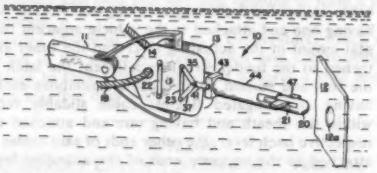


3,972,554

RING TYPE RECOVERY TOOL

Paul V. Tryon, Kailua, Hawaii, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 12, 1976, Ser. No. 648,353
Int. Cl.² B63C 7/16; B66C 1/54
U.S. Cl. 294—97 9 Claims



1. An apparatus for recovering objects having an opening comprising:
a pair of spaced apart side plates each provided with at least one lateral slot;
means connected to the side plates for extending therefrom and having a diameter less than the opening and being provided with a cavity;
a pair of actuators each slidably mounted in the lateral slots of both side plates and adapted for reciprocable converging motion;
means carried between the actuators for holding them apart;
means coupled to the actuators for translating converging motion thereof into a longitudinal force;
means carried near the end of the extending means and coupled to receive the longitudinal force for rotating into the cavity upon the reception of the longitudinal force.

3,972,555

TONG TYPE RECOVERY TOOL

Paul V. Tryon, Kailua, Hawaii, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

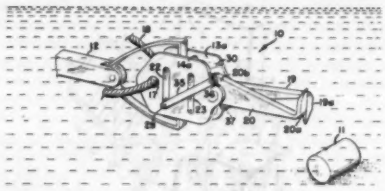
Filed Jan. 2, 1976, Ser. No. 646,227
Int. Cl.² B63C 7/20; B66C 1/42
U.S. Cl. 294—106 5 Claims

1. An apparatus for recovering objects comprising:
a pair of spaced apart side plates each provided with at least one lateral slot;
a pair of actuators each slidably mounted in the lateral slots of both side plates and adapted for reciprocable converging motion;

means for biasing the actuators away from one another;

a pair of tongs pivotally mounted between the side plates at a central front portion and having an off-center portion;

a pair of lever arms, each connected at a first end to a respective actuator and diagonally extending across the



side plates to be connected at a second end to a respective tong at the off-center portion whereby when the actuators are squeezed together, the lever arms spread the tongs apart and when the actuators are released, the biasing means pulls the tongs together and allows them to grab the object.

3,972,556

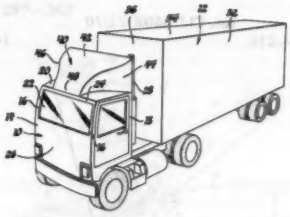
TRACTOR-TRAILER AERODYNAMIC DRAG REDUCER

William T. Mason, Jr, Lake Orion, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 15, 1974, Ser. No. 514,638

Int. Cl.² B60J 9/00

U.S. Cl. 296—1 S 4 Claims



1. In combination with a tractor-trailer vehicle including a tractor roof having a leading edge and a trailing edge and a trailer body including a forward wall spaced rearwardly of the trailing edge of the tractor roof and a trailer roof having a leading edge at an elevation greater than the tractor roof, an aerodynamic drag reducer mounted on the tractor roof and comprising: a generally wedge shaped drag reducing device with side surfaces and a top surface having a leading edge and a trailing edge, the leading edge of the device being faired into the tractor roof and the top surface extending rearwardly therefrom and diverging upwardly from the tractor roof to streamline airflow around the tractor and over the trailer roof, the angle of inclination of the top surface relative the tractor roof being such that the surface thereof falls between an angle alpha which is defined by the tractor roof and a line drawn from the leading edge of the device to the leading edge of the trailer roof and an angle beta which is defined by the tractor roof and a line drawn between the leading edge of the device and the intersection of a vertical projection of the trailing edge of the device and a horizontal projection of the leading edge of the trailer roof, the leading edge of the device being of lesser width than the width of the tractor roof, the side surface extending generally vertically between the top surface of the device and the tractor roof and diverging toward the respective outboard edges of the tractor roof, the juncture of the side surface with the top surface of the tractor roof following a curvilinear path providing a concave-convex contour to the side walls to streamline airflow around the tractor and to divert air smoothly around the sides of the trailer to reduce aerodynamic drag on the tractor-trailer vehicle.

3,972,557

HYDRAULIC CAB-TILTING SYSTEMS

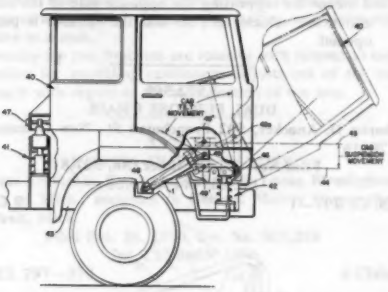
Michael R. Hudston, Ingham, and Henry J. Levington, Snelland, both of England, assignors to Clayton Dewandre Company Limited, Lincoln, England

Filed Oct. 25, 1974, Ser. No. 517,963

Claims priority, application United Kingdom, Oct. 31, 1973, 50585/73

Int. Cl.² B62D 23/00

U.S. Cl. 296—35 R 7 Claims



1. In a hydraulic ram system for tilting a cab that is mounted on a vehicle chassis by a resilient suspension between a first position that the cab normally occupies during vehicle operation and a second lifted position providing access to the engine and/or other components, and wherein a ram assembly comprising a cylinder having a bore containing a sliding piston is adapted to be connected between the cab and the vehicle chassis, characterized by said bore having two different diameter cylindrical sections, with said piston having a sliding sealing fit within the smaller diameter bore section and having substantial radial clearance with the second bore section, said piston being disposed within said second bore section so as to be spaced from the bore wall to render the ram assembly passive when the cab is in said first position, and the axial length of said second bore section being sufficient to accomodate maximum movement of said cab on its suspension in said first position.

3,972,558

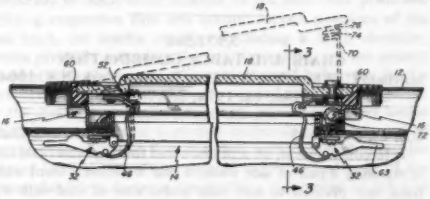
SUNROOF STRUCTURE

Charles G. Horn, West Newton, Mass., assignor to Aro Manufacturing Company, Inc., West Newton, Mass.

Filed Dec. 27, 1974, Ser. No. 536,814

Int. Cl.² B60J 7/00

U.S. Cl. 296—137 B 8 Claims



1. A sunroof structure for a vehicle having a roof opening, said structure comprising;

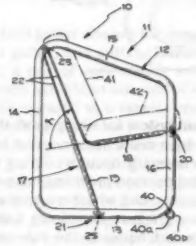
a frame secured to the vehicle roof and extending about the roof opening,

a sunroof dimensioned to cover said roof opening,
gasket means disposed between the peripheral edge of the sunroof and the edge defining the opening,
a plurality of fasteners connected to the frame and coupled to the sunroof to hold the peripheral edge of the sunroof closed against the vehicle roof,
each said fastener including flexible spring means,
at least one of said fasteners disposed on one side of the sunroof and at least another one of said fasteners disposed on an opposite side of the sunroof,
said one fastener remaining attached to the sunroof and said flexible spring means of said one fastener forming a pivot for the sunroof with the other fastener disengaged from the sunroof to permit the opposite side of the sunroof to be raised,
and means for supporting the opposite side of the sunroof above the vehicle roof so that the sunroof is partially opened.

3,972,559
DUAL PURPOSE CHAIR

Charles D. Anacker, 502 Frenchman St., New Orleans, La. 70116

Filed Nov. 27, 1974, Ser. No. 527,813
Int. Cl.² A47C 13/00
U.S. Cl. 297—1 9 Claims



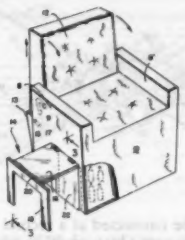
1. In a dual purpose chair, the combination comprising
a. a frame assembly having two positions,
b. a sling attached to the frame assembly at first and second locations, the sling including first and second alternate seating sections and a third and flexible section intermediate the two seating sections,
c. the third section defining a backrest slidably supported by the frame assembly, at a third location,
d. the first and second sections having ends which respectively have releasably anchored attachments with the frame assembly at said first and second locations, said attachments blocking endwise slippage of the first and second sections relative to said attachments when the chair is shifted between said two positions and the third section slides relative to the supporting frame assembly said third location remaining higher than said two locations in each of said chair positions.

3,972,560
CHAIR AND TABLE COMBINATION

Mayfield C. White, 201 W. 122nd St., New York, N.Y. 10040

Filed Dec. 18, 1974, Ser. No. 533,876
Int. Cl.² A47B 83/02
U.S. Cl. 297—145 2 Claims

1. In combination, an arm chair and folding table, said chair comprising a pair of side walls, a rear wall and a front wall, a back rest pivoted to said side walls, one of said side walls having an opening therein, a folding table, means movably securing said table to said one side wall in said opening, said table comprising a table top, a U-shaped support hinged to one end of said table top, said U-shaped support having spaced legs into which said table top may be folded, a solid panel support hinged to an opposite end of said table top, means for positioning said table top, said U-shaped support and said panel support, when in folded condition, in alignment with said opening; said means for positioning comprising an

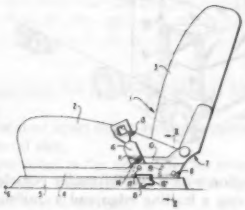


extension member hinged to said opposite end of said table top, a horizontally extending rod secured to said extension member, a pair of vertically extending spaced channels positioned in said opening, and said rod being slidable in said channels.

3,972,561
RETAINING MECHANISM FOR THE PASSENGERS OF VEHICLES

Werner Breitschwerdt, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Oct. 3, 1974, Ser. No. 511,626
Claims priority, application Germany, Oct. 4, 1973, 2349829
Int. Cl.² B60R 21/10
U.S. Cl. 297—216 14 Claims



1. A retention mechanism for the passengers of vehicles having seats provided with a seat cushion and a backrest, wherein the retention mechanism yields upon reaching a predetermined load, including means for transmitting the yielding movement of the retention mechanism onto the associated backrest independently of the seat cushion so as to move the backrest in a direction opposite to the movement of the passenger associated with that backrest.

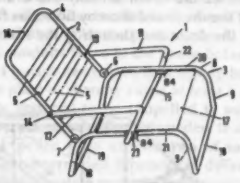
3,972,562
COLLAPSIBLE FURNITURE

Bjorne Thorwald Montrose, Leigh-on-Sea, England, assignor to M. Rosenberg-Bischoff and Jean Bischoff

Filed Sept. 26, 1974, Ser. No. 509,500
Claims priority, application United Kingdom, Sept. 27, 1973, 45350/73
Int. Cl.² A47C 1/025, 17/16
U.S. Cl. 297—359 6 Claims

1. A foldable chair comprising three rigid frames, one frame constituting a seat support having front and rear ground supports, a second one constituting a back support and a third one constituting two armrests, the back support frame being pivotally connected to the seat support frame, and the arm-

rests frame being pivotally connected to the back support frame, both pivoting axes being horizontal and parallel to one with the other and spaced apart, and the shape and size of the armrests frame being such that said armrests frame is adapted to be pivoted to pass under said rear ground support of the seat support frame, into a position in which it forms a ground



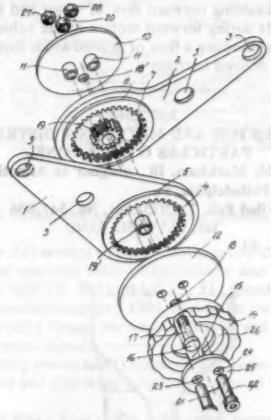
support for the back support frame when the latter is in a swung down extended position to form a bed device, the armrests frame supporting the back support frame when the armrests frame is thus supported on the ground, said armrests frame having a cross piece interconnecting said two armrests and disposed under said seat support frame when said back support frame is raised.

3,972,563

SEATBACK TILT ADJUSTMENT MECHANISM

Gustaf Erik Gustafsson, Januarivagen 19, Vaxjo, Sweden (352 47)

Filed Sept. 4, 1975, Ser. No. 610,243
Int. Cl.² A47C 1/025; B60N 1/06
U.S. Cl. 297—362 **5 Claims**



1. An adjustable mechanism for seats, primarily for motor vehicles, comprising

a. a first bracket to be secured to one portion of said motor vehicle seat,

b. a second bracket cooperating with said first bracket for being secured to a second portion of the motor vehicle seat,

said first bracket forming an integral structure and comprising a gear ring of internal teeth and said second bracket also forming an integral structure and comprising a gear ring of internal teeth of the same diameter as the gear ring of the first bracket, with the number of teeth of the first gear ring and of the second gear ring, respectively, differing by a predetermined quantity,

c. a raised portion on said first bracket,

d. a recess in said second bracket,

said recess corresponding to said raised portion of the first bracket, with said brackets thereby being capable of being monted for rotative motion in each other,

e. at least one gear wheel having a substantially smaller diameter than said gear rings,

said one gear wheel being movable in a planetary orbit inside of said gear rings and being mounted for meshing therewith,

f. two cover plates for covering the two gear rings,

one of said cover plates fitting into a corresponding recess of the first bracket and a second of said cover plates covering the second gear ring by enclosing a raised portion thereof, and

g. a shaft comprising the axis of rotation of said gear wheel penetrating said cover plates for making said plates rotative as a unit,

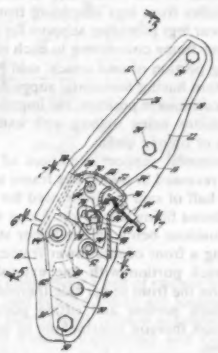
whereby the two brackets are rotative with respect to each other for providing continuous adjustment of the seat back with regard to the base portion of the seat.

3,972,564

INERTIA SEAT BACK LOCK

Alfonsas Arlauskas, Troy, and Richard D. Loose, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

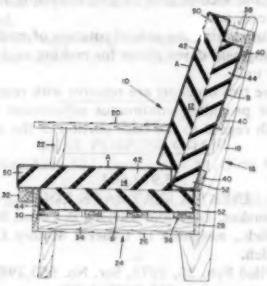
Filed Feb. 26, 1975, Ser. No. 553,298
Int. Cl.² B60N 1/04
U.S. Cl. 297—378 **4 Claims**



1. In combination with a vehicle seat including a seat cushion and a seat back, an inertia seat back lock comprising, in combination, first and second pivotally interconnected members respectively secured to the seat back and seat cushion to pivot the back to the cushion for tilting movement, the first member including a pair of detent shoulders spaced circumferentially of each other relative to the seat back pivot and defining respective first and second locked positions of the seat back, an inertia member including a latch shoulder, means pivotally mounting the inertia member on the second member with the center of gravity thereof below the inertia member pivot, stop means on the second member engageable by the inertia member under gravity bias to positively locate the inertia member in a normal inoperative position out of engagement with the first member with the latch shoulder thereof located out of the path of movement of both of the detent shoulders during normal tilting movement of the seat back, inertia forces applied to the seat cushion and inertia member pivoting the inertia member to an operative position wherein the latch shoulder thereof is in the path of movement of the detent shoulders for engagement by one detent shoulder to lock the seat back in a respective locked position, the

resultant force between the engaged shoulders being normal to a line between such shoulders and the seat back pivot to place the inertia member in compression and bias the inertia member toward the operative position to maintain the shoulders in engagement.

3,972,565
COUCH
Edwin Smith, 102 Joe Lee, Lot L, San Antonio, Tex. 78233
Filed July 23, 1975, Ser. No. 598,286
Int. Cl.² A47C 7/02
U.S. Cl. 297—455 **8 Claims**



1. A couch of the removable cushion type wherein the couch includes front legs extending from an arm support to the floor, rear legs providing support for a back portion of the couch, lower frame connecting to each of said legs for providing a sitting portion of said couch, said back portion and said sitting portion having horizontal support members for retaining couch cushions in position, the improvement comprising:

said cushions being oblong with extensions on opposing halves of oblong ends;

said horizontal support members of said sitting portion being recessed in said lower frame to receive at least the lower half of said cushions used for said sitting portion;

said cushions filling said lower frame with one extension of said cushions being on the upper side thereof and overhanging a front of said lower frame; said cushions filling said back portion with one extension of said cushions being on the front upper side thereof, said cushions filling said back portion and sitting portion with lower rear extension thereon interlocking to retain said cushions in position.

3,972,566
SOLIDS CONCENTRATOR
Frank Howard Brockett, III, Bellevue, and Arthur Francis Sullivan, Redmond, both of Wash., assignors to The International Nickel Company, Inc., New York, N.Y.
Filed Mar. 4, 1975, Ser. No. 555,117
Int. Cl.² E02F 3/88, 7/06
U.S. Cl. 299—8 **10 Claims**

1. A undersea mining vehicle for providing a concentration of desired sizes of solid mineral aggregates that are found dispersed at the level of an undersea floor comprising:

a. a vehicle structure adapted for being moved in a forward direction on an undersea floor;

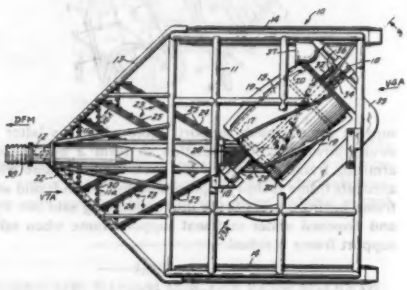
b. a concentrator drum having the configuration of a hollow cylinder with an entrance at one end and an exit at the opposite end;

c. a mounting for supporting the drum with the drum axis horizontal and with the lower periphery at the undersea floor, said mounting being on the vehicle and supporting the drum rotatably around the central axis of the drum;

d. traction means, attached to the exterior periphery of the drum, for engaging the undersea floor and rotating the drum around the drum axis when the vehicle is moved in the forward direction on the undersea floor;

e. means for contacting, moving and directing desired sizes of aggregates of undersea floor solids into the drum entrance and for rejecting undesirably large solids away from the entrance when the vehicle is moved forward;

f. solids lifters inside the drum and connected to move with the interior of the drum around the drum axis during rotation of the drum and thereby lift solids from the lower portion of the drum and then drop the solids towards the drum axis;

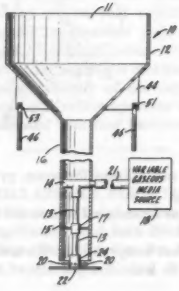


g. a transfer guide mounted in fixed position for catching solids falling from the lifters and for guiding the falling solids through the drum exit;

h. a screen disposed across the space between the drum exit and the exit end of the drum cylinder for preventing passage of desired solids outward except through the exit and for enabling outward flow of water and undesirably fine solids during forward motion of the vehicle; and

i. means for directing a flow of desired solids from the drum exit to a desired location.

3,972,567
APPARATUS FOR AND METHOD OF DISTRIBUTING PARTICLES OVER A ZONE
George A. Uhl, Markham, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.
Filed Feb. 7, 1975, Ser. No. 547,836
Int. Cl.² B65G 53/40
U.S. Cl. 302—61 **28 Claims**



1. Apparatus for distributing particulate material over a zone defined by sidewalls, said apparatus being located so that the distances between the center of an outlet means, described hereinafter, and at least two points of equal latitude on the sidewalls of said zone are not equal, comprising:

a supply hopper, having inlet means and outlet means, for holding particulate material;

a deflection plate located adjacent to the end of said outlet means away from said supply hopper to deflect the direction of at least a portion of said particulate material flowing through said outlet means when gaseous media is expelled by the conduits, described hereinafter; and

at least two conduits in fluid communication with at least one source of gaseous media, each of said conduits being situated such that at least a portion of said gaseous media from said conduits flows in the space between the end of said outlet means away from said supply hopper and said deflection plate to thereby cause at least a portion of said particulate material to be propelled in substantially the same direction as said flow; provided that said gaseous media is expelled from at least two of said conduits at different, predetermined flowrates in different directions so that said particulate material is substantially uniformly distributed over said zone.

3,972,568

VEHICLE BRAKE ANTI-BLOCK SYSTEM WITH SELECTIVE STEERING, OR BRAKING PRIORITY

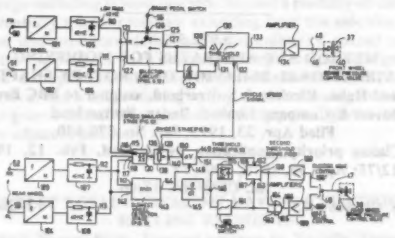
Helmut Fleischer, Schwieberdingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed May 30, 1975, Ser. No. 582,184

Claims priority, application Germany, June 20, 1974, 2429555

Int. Cl.² B60T *8/02*

U.S. Cl. 303—21 A **8 Claims**



1. Vehicle brake anti-lock system for multi-axle vehicles, comprising

means (28–32) sensing circumferential speed of at least two wheels at opposite sides of the vehicle and deriving respective right (R, 50) and left (L, 51) speed signals;

a speed simulation stage (120) having an output of said speed sensing means connected thereto and providing a vehicle speed signal;

differentiating means (129) connected to some of the sensing means and providing a rate-of-change of wheel speed signal;

a source of brake fluid under differential pressure (61, 62, 63);

valve means (40, 41) controlling supply of differential brake fluid pressure to the brakes of the wheels of the vehicle;

operator controlled means (43) controlling supply of pressurized brake fluid from said source (61, 62, 63) to said valve means (40, 41);

a wheel brake controller (100) connected to and controlled by said wheel speed signals, said vehicle speed signal, and the rate-of-change signals and providing output signals to said valve means for selectively energizing said valve means and controlling application to and drainage of said differentially pressurized brake fluid to effect lowering or raising of differential brake fluid pressure in the brakes as commanded by the relative values of said signals,

a selection circuit (125) connected to have said left and right speed signals applied thereto and, selectively, providing an output signal representative of the speed of the respective faster, or slower one of said wheels in dependence on whether said selection circuit is set in either a select high or select low mode position;

and pressure sensing means connected to sense the pressure of pressurized brake fluid, as controlled by said operator control means, and providing an output signal to said selection circuit (125) to control the mode position of said selection circuit;

said valve means comprising a common control valve (40) controlling the supply of differential pressurized brake fluid to both the left and right wheels, and said controller (100) controlling the operation of said common valve (40) in accordance with the relative value of the selected output signal as determined by the selected mode by said selection circuit.

3,972,569

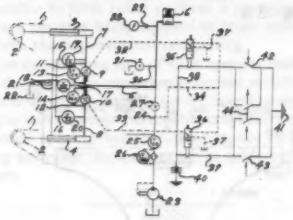
AUTOMATIC TRACK TENSIONING SYSTEM FOR TRACKED VEHICLE

William H. Bricknell, St. Thomas, Canada, assignor to Canadair Flextrac Ltd., Calgary, Canada

Filed Mar. 31, 1975, Ser. No. 563,328

Int. Cl.² B62D *55/30*

U.S. Cl. 305—10 **7 Claims**



1. A tracked vehicle comprising a pair of endless tracks, end wheels around which said endless tracks are looped and entrained respectively, a pair of track tension adjustment means connected to said end wheels respectively and constructed and arranged to vary the tension in the corresponding endless track, a main hydraulic control circuit operatively connected to said pair of track tension adjustment means, a pair of pilot valves inserted in the main hydraulic control circuit, a hydraulic fluid accumulator communicating with the main hydraulic control circuit, a pilot control circuit connected to the pilot valves, a pair of selectively controllable devices connected by the pilot control circuit to the pilot valves respectively, and a vehicle direction control mechanism connected to the selectively controllable devices and selectively actuating the latter in response to desired changes in the direction control of the vehicle.

3,972,570

WEAR-RESISTANT COMPOSITE TRACK SHOE

Charles G. Massieon, Marquette Heights, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

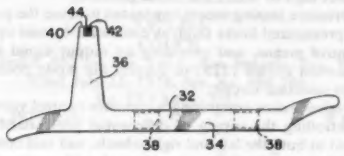
Filed Apr. 17, 1975, Ser. No. 568,950

Int. Cl.² B62D *55/28*

U.S. Cl. 305—54 **7 Claims**

1. In a track shoe for a track-type vehicle having a one-piece base plate and grouser bar integrally formed of a ductile material, a tip projecting outwardly from said grouser bar, an elon-

gate continuous slot formed in the tip of said grouser bar, and an elongate continuous wear bar insert made of a composite



alloy having high wear-resistant characteristics being bonded in said slot and presenting a long-life wear surface.

3,972,571

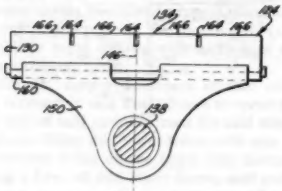
BOOM SLIDER ASSEMBLY

Frank J. Benkowski, Bedford, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Continuation of Ser. No. 397,294, Sept. 14, 1973, abandoned, which is a division of Ser. No. 240,759, April 3, 1972, which is a continuation of Ser. No. 29,408, April 17, 1970, Pat. No. 3,782,790. This application July 9, 1975, Ser. No. 594,300

Int. Cl.² F16C *17/00*

U.S. Cl. 308—3 R **3 Claims**



1. A boom assembly comprising a first boom section having a longitudinal axis and a predetermined longitudinal curve of deflection upon application of a predetermined load to said first boom section, a second boom section operatively connected with said first boom section, means for effecting relative movement between said boom sections to thereby extend and retract said boom assembly, means for applying the predetermined load to said first boom section to effect deflection of said first boom section to a condition in which the longitudinal axis of said first boom section has a curvature matching the predetermined longitudinal curve of deflection for said first boom section, and slider means pivotally mounted on said second section of said boom assembly for movement about a transverse axis and having a surface of a predetermined area disposed in abutting engagement with said first section of said boom assembly for transmitting a uniform bearing load throughout the area of said surface to an engaged surface area of said first boom section to facilitate relative movement between said sections of said boom assembly, said slider means having a deflection Y equal to the deflection of said first boom section at any transverse section located a distance X from a plane extending along the transverse axis about which said slider means is mounted for pivotal movement and perpendicular to said surface, said deflection Y being defined by the following equation:

$$Y = \frac{WX^2}{24EI}(X^2 + 6(L/2)^2 - 4(L/2)X)$$

in which

W= uniform bearing load per unit of length of said slider means

E= Young's modulus of elasticity for the material of the slider assembly

I= the moment of inertia of the cross sectional area of the slider

$L/2$= the distance from said plane to one end of said slider means

said slider means including a slider pad disposed in abutting engagement with said first section of said boom assembly and having a central axis which extends generally parallel to the central axis of said first boom section, said slider pad including means for dividing said slider pad into a plurality of sections having outer surfaces disposed in engagement with said first section of said boom assembly to enable relative movement to occur between said sections of said slider pad upon deflection of said boom assembly under the influence of an operating load to thereby facilitate maintenance of the surfaces of said slider pad sections in abutting engagement with said first section of said boom assembly upon deflection of said boom assembly, said means for dividing said slider pad into a plurality of sections includes means for defining a plurality of slots each of which has a longitudinal axis which extends across said slider pad in a direction transverse to the central axis of said slider pad, each of said slots having a width which is less than the width of a section of said slider pad as measured along the central axis of said slider pad.

3,972,572

METHOD AND APPARATUS FOR MODIFYING VIBRATIONAL BEHAVIOR OF A ROTARY SHAFT

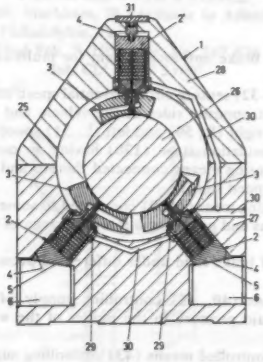
Alfred Hohn, Kirchdorf, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Apr. 23, 1975, Ser. No. 570,630

Claims priority, application Switzerland, Feb. 12, 1975, 1712/75; Apr. 30, 1974, 5906/74

Int. Cl.² F16C *17/06*

U.S. Cl. 308—73 **12 Claims**



1. A bearing structure of the segmented type for supporting a rotatable shaft which comprises a housing enclosing a section of the shaft and which includes a plurality of bearing segments distributed about the periphery of the shaft section, said bearing housing including a plurality of internal bores similarly distributed about the periphery of the shaft, bearing segment supports mounted in said bores, said bearing segment supports including a blind bore, a stack of disc-type springs mounted in said bore which determine the vibrational behav-

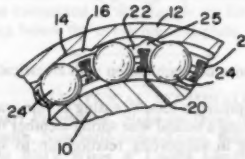
iour of the shaft, a socket member for the bearing segment slidably mounted in the entrance to said bore in contact with the corresponding end of said spring stack, means for pressing one face said socket member against the spring stack to place the latter under compression against the bottom of said bore, and access openings in said bearing housing to said internal bores whereby the corresponding bearing segment supports may be removed and replaced with other similarly constructed supports but which have a different elastic characteristic therby effecting a correspondingly modified vibrational behaviour of the shaft.

3,972,573

CAGE FOR AN OVERRUNNING CLUTCH

Americo E. Marola, Torrington, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Aug. 18, 1975, Ser. No. 605,633
Int. Cl.² F16C *33/46*; F16D *41/07*
U.S. Cl. 308—217 **5 Claims**



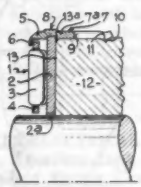
1. A cage assembly for an overrunning clutch comprising: a cage including at least one side rim and a plurality of circumferentially spaced crossbars extending from the side rim, said rim and crossbars defining circumferentially spaced roller receiving pockets, each crossbar having a longitudinal groove and a longitudinal slit extending circumferentially from the groove; and a roller biasing spring member having its base in the groove and another portion extending through the slit into the adjacent pocket.

3,972,574

THRUST ROLLING BEARING HAVING CYLINDRICAL ROLLING ELEMENTS

Alfred Pitner, Paris, France, assignor to Nadella, France, a part interest

Filed Feb. 20, 1975, Ser. No. 551,276
Claims priority, application France, Feb. 25, 1974, 74.06309; Nov. 12, 1974, 74.37299
Int. Cl.² F16C *19/00*
U.S. Cl. 308—235 **23 Claims**



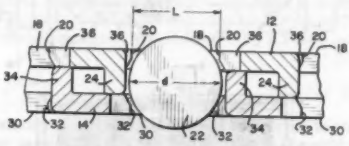
1. A thrust rolling bearing for being axially supported by a radial surface of a support and comprising rolling elements, a cage in which the rolling elements are mounted, a raceway plate for the rolling elements, the raceway plate having a circumferentially extending edge, retaining means comprising a first portion which retains the cage and raceway plate with respect to each other and a second portion having maintaining means for cooperation with complementary means provided on the support for maintaining the thrust bearing assembled with the support, the first portion and second portion being in adjacent relation at said edge of the raceway plate and extending in the same axial direction relative to the raceway plate.

3,972,575

CAGE FOR ROLLER BEARING

Moichi Chiba, Yokosuka, and Seiji Higuchi, Tokyo, both of Japan, assignors to The Torrington Company, Torrington, Conn.

Filed June 23, 1975, Ser. No. 589,072
Claims priority, application Japan, July 3, 1974, 49-77810
Int. Cl.² F16C *33/38*
U.S. Cl. 308—235 **3 Claims**



1. In a bearing cage with two interconnected members each member having a plurality of circumferentially spaced substantially rectangular openings with the openings in one member being aligned with and spaced from the openings in the other member to form roller pockets, a portion of each long side of each opening being adapted to retain rollers placed in the pockets, the improvement comprising:

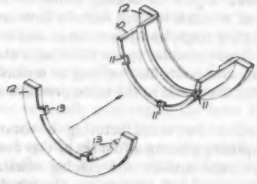
a tongue on one long side of each opening and in all pockets, the tongue on one interconnected member extending toward the other interconnected member and facing the tongue on said other interconnected member, the circumferential spacing between the tongues in each pocket being such that the tongues act as guide surfaces for the rollers.

3,972,576

FLANGED HALF BEARINGS

Joseph Henry Hill, Greenford, England, assignor to Vandervell Products Limited, Berkshire, England

Filed Feb. 27, 1975, Ser. No. 553,662
Int. Cl.² F16C *33/14*
U.S. Cl. 308—237 R **4 Claims**



1. A flanged half bearing comprising a thin wall flexible half bearing liner and a flange extending radially outwardly of at least one end of the liner and attached to the liner by means which allow the circumferential shape of the liner to vary relative to the flange, characterised in that the inner circumferential edge of the flanged end of the bearing has a curved profile as viewed in cross-section through the bearing axis.

3,972,577

ISOBARIC DEVICE WITH ROTATING ELECTRICAL CONTACTS

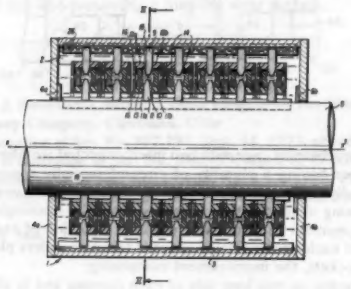
Joel Marie Charles, La Valette, and Jean-Pierre Maurice Ghiglione, La Crau, both of France, assignors to Etat Francais represented by Delegation Ministerielle pour l'Armement, France

Filed Sept. 15, 1975, Ser. No. 613,195

Claims priority, application France, Sept. 23, 1974, 74.31946

Int. Cl.² H01R *39/00*

U.S. Cl. 339—5 L 13 Claims



1. An isobaric device housing a rotating electrical contact, comprising a sealed, water-tight housing filled with an electrically insulating liquid at a pressure which is substantially the same as the pressure of the environment in which the device is to be used, a rotating electrical contact comprising a pair of coaxial concentric electrically conducting collars, one of which is rotatable, the other being fixed, which collars are separated by a closed annular space filled with an electrically conductive liquid, wherein each pair of electrically conductive collars is sandwiched between two pairs of insulating rings and further between a pair of sealing joints of an elastomeric material one of which is located radially between each of said pairs of insulating rings, and joints, rings and collars together defining the closed annular space filled with electrically conductive liquid, said joints also serving as means for maintaining said conductive liquid at the same pressure as said insulating liquid.

11. A process for manufacturing a rotating electrical contact, comprising placing a first set of two concentric washers on a horizontal surface and placing coaxially on top of those washers a pair of concentric electrically conductive collars, each of which has an insulating ring fused to each axial face thereof, and an elastomeric sealing joint located radially between the insulating rings on the axial faces of said collars which face said first set of washers, filling electrically conductive liquid metal into the space defined between said joint, rings and collars, placing a second elastomeric sealing joint radially between the insulating rings on the other axial faces of said collars, and placing a second set of two concentric washers over said second joint, said washers being coaxial with the first set, the collars and joints.

3,972,578

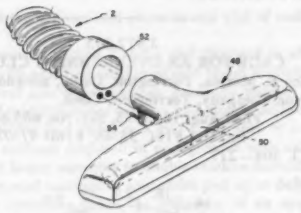
ELECTRICAL CONTACT TERMINAL HAVING IMPROVED WIRE-RECEIVING SLOT

Charles Edward Reynolds, Mechanicsburg, and John Clinton Swartz, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 18, 1975, Ser. No. 569,421

Int. Cl.² H01R *3/04*

U.S. Cl. 339—15 10 Claims



1. A flexible hose in combination with electrical conductor means:

said hose comprising a tubular casing of thin-walled supple material having a helical wire spring member therein, said spring being in supporting relationship to said tubular casing,

said spring member constituting said conductor means, said conductor means having a terminal on one end thereof, said terminal having a generally U-shaped conductor-receiving portion which has a bight and sidewalls, said sidewalls having parallel free ends which are remote from said bight, wire-receiving slot means extending inwardly from said free edges towards said bight, said terminal having contact means integral with, and extending from, said conductor receiving portion, said conductor being received in said slot means whereby edge portions of said slot means are in electrical contact with said conductor.

3,972,579

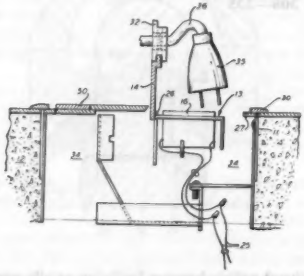
ELECTRICAL INSERT DEVICE

John E. Kohaut, West Orange, N.J., assignor to Raceway Components, Inc., Linden, N.J.

Filed Sept. 3, 1974, Ser. No. 502,284

Int. Cl.² H01R *13/44*, *13/60*

U.S. Cl. 339—34 2 Claims



1. In an electrical insert device adapted to be disposed at an opening defined by rim means of a floor structure:

a. a first plate having opposite ends,

b. means pivotally connecting said first plate intermediate its ends to said insert device, whereby said first plate may be alternately rotated to close onto said rim means

thereby closing said opening therein or to extend above said opening,

c. a fixture support plate secured to said first plate and pivot means in angular relation thereto and so movable with the first plate on rotation thereof,

d. an electric socket secured to said fixture support plate and so movable therewith,

e. said electric socket being formed for complementary connection of a cable plug therewith,

f. whereby the fixture support plate will be disposed inwardly of the floor opening when said first plate is closed onto said rim means and, when it is desired to connect a cable plug to the socket device, said first plate may be rotated to a position above said opening and said fixture support plate thereby rotated therewith to a position across the floor opening and said cable plug may be moved downwardly onto said fixture support plate and into connection with said socket device, and

whereby the first plate and fixture support plate may then be rotated to dispose the first plate across said opening and onto said rim means and the fixture plate and cable plug so connected to the electric socket disposed in said opening below the overlying first plate.

3,972,580

ELECTRICAL TERMINALS

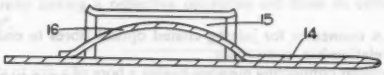
Donald Stuart Pemberton, Stoke-on-Trent, and Gordon Roy Frank Smith, Newcastle-under-Lyme, both of England, assignors to Rist's Wires & Cables Limited, Birmingham, England

Filed Dec. 13, 1974, Ser. No. 532,382

Claims priority, application United Kingdom, Dec. 28, 1973, 59967/73

Int. Cl.² H01R *11/16*

U.S. Cl. 339—47 R **3 Claims**



1. An electrical terminal formed from sheet conductive material and including a socket connector, a blade connector integral with and extending from said socket connector, and a resilient member of strip-like form extending within said socket connector, said member being secured at one end to the terminal, and being capable of being flexed towards an inner wall of the socket connector, the other end of said resilient strip-like member being free, and being formed with a generally centrally disposed substantially semi-spherical projection engageable with a surface of the terminal in response to flexure of the member towards said inner wall, engagement of said projection with said surface permitting twisting along the length of the member relative to the socket connector to accommodate misalignment of said socket connector and a mating blade connector in use.

3,972,581

UNDERWATER ELECTRICAL CONNECTOR

Ronald C. Oldham, Chandlers Ford, England, assignor to International Standard Electric Corporation, New York, N.Y.

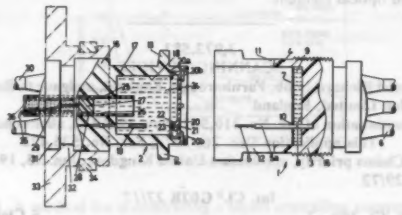
Filed May 1, 1975, Ser. No. 573,751

Claims priority, application United Kingdom, July 4, 1974, 29906/74

Int. Cl.² H01R *16/52*

U.S. Cl. 339—96 **5 Claims**

1. An electrical connector comprising: mating first and second connector members; said first connector member being provided with at least one electrically conducting pin extending therefrom; said second connector member having means defining a cavity therein said cavity defining means including a movable element; an electrical socket in said second connector member extending into one end of said cavity and being engageable with said pin when said connector members are mated; a diaphragm closing the other end of said cavity, said diaphragm being penetrable by said pin during mating of said first and second connector members; said cavity being filled with a semi-mobile nonelectrically-conducting compound; and pressurizing means exposed to said cavity for



automatically reducing the volume of said cavity to compensate for any loss of said compound from said cavity during normal usage of the connector, said pressurizing means including said movable element and resilient means biasing said movable element toward said cavity, said pressurizing means comprising a cylinder in said second connector member, said cylinder opening into said cavity, said movable element comprising a piston slidable in said cylinder; and said resilient means biasing said piston in said cylinder toward said cavity.

3,972,582

LASER BEAM RECORDING SYSTEM

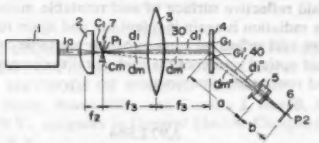
Shigenori Oosaka; Masaru Noguchi, and Tsunehiko Takahashi, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Sept. 4, 1974, Ser. No. 503,090

Claims priority, application Japan, Sept. 7, 1973, 48-100826

Int. Cl.² G02B *27/17*

U.S. Cl. 350—7 **4 Claims**



1. A laser beam recording system for recording information on a recording medium with a scanning laser beam comprising, in combination, a laser source for emitting a collimated laser beam, a rotary polygonal optical element having an axis of rotation which is vertically oriented, a first cylindrical lens disposed in the optical path of the laser beam emitted by said laser source for vertically converging the laser beam to form a horizontally extending linear light spot on the face of said rotary polygonal optical element, a convergent lens for receiving the beam deflected by said rotary polygonal optical element and for vertically collimating and horizontally converging said beam to form a vertically extending linear light spot on a first focusing plane, a second focusing plane having a recording medium disposed thereon, a second cylindrical lens having an aperture, an elemental hologram plate disposed in said first focusing plane between said convergent lens and said second cylindrical lens for vertically converging the beam passing therethrough and for directing said beam incident thereto, towards said aperture and through said second cylindrical lens for horizontally converging the laser beam incident thereto to form a horizontally extending linear light spot on

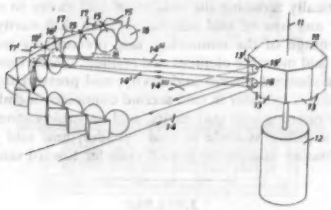
said second focusing plane behind said aperture, said elemental hologram plate comprising a plate having a plurality of vertically extending linear elemental holograms arranged in parallel relationship with each other and in side-by-side relationship, said second cylindrical lens being arranged to horizontally converge the laser beam incident thereto to form a light spot on said second focusing plane whereby the laser beam scans the surface of said recording medium on said second focusing plane during the rotation of said rotary polygonal optical element.

3,972,583

SCANNING DEVICES

Daniel Richard Lobb, Farnborough, England, assignor to Redifon Limited, England

Continuation of Ser. No. 310,532, Nov. 29, 1972, abandoned.
This application Dec. 26, 1974, Ser. No. 536,472
Claims priority, application United Kingdom, Jan. 25, 1972, 3429/72
Int. Cl.² G02B 27/17
U.S. Cl. 350—7 5 Claims



1. A device for scanning, or deflecting, a beam of radiation comprising a rotatable mirror drum of regular polygonal cross-section, on one reflective surface of which the beam is initially incident and by which the beam of radiation is initially reflected, and a plurality of static optical systems disposed in an arc, for receiving, each said optical system in sequence, the beam of radiation initially reflected from said rotatable mirror drum and for redirecting the beam of radiation back to the same said reflective surface of said rotatable mirror drum so that the radiation is again incident on, and again reflected by, the same said reflective surface of the rotatable mirror drum each said optical system of the said plurality comprising a field lens and roof prism combination.

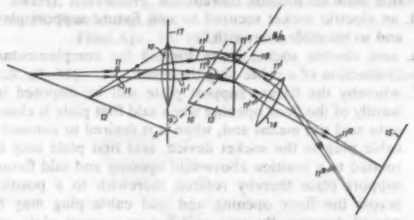
3,972,584

COMPOUND OPTICAL SYSTEM WITH IMAGE TILT COMPENSATION

Daniel Richard Lobb, Farnborough, England, assignor to Redifon Limited, England

Continuation of Ser. No. 286,969, Sept. 7, 1972, abandoned.
This application June 26, 1974, Ser. No. 483,386
Claims priority, application United Kingdom, Sept. 7, 1971, 41648/71; Jan. 13, 1972, 1638/72; Aug. 18, 1972, 38571/72
Int. Cl.² G02B 17/00
U.S. Cl. 350—48 13 Claims

1. An optical arrangement comprising first and second optical imaging systems with an optical device including an optical refracting element therebetween, said first and second optical imaging systems respectively defining first and second optical axes, said first optical imaging system being positioned in the said optical arrangement for viewing an object surface inclined to the first optical axis, said inclined object surface defining a first image surface of said first optical imaging system correspondingly inclined to the first optical axis, said optical device defining a deflected first optical axis part and providing a deflected image at a surface different from said first image surface, said second imaging system being positioned in the said optical arrangement for viewing said deflected image and for providing a second image upon a target surface, said deflected first optical axis part and said second optical axis intersecting at a point located substantially at said



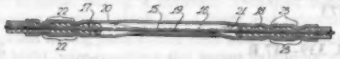
deflected image surface and the angle formed between the second optical axis and the deflected image surface defining a corresponding angle between the second optical axis and the target surface.

3,972,585

CONNECTORS FOR OPTICAL FIBERS

Jack F. Daigleish, Ottawa, and Helmut H. Lukas, Carleton Place, both of Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed Feb. 13, 1975, Ser. No. 549,661
Int. Cl.² G02B 5/14
U.S. Cl. 350—96 C 5 Claims



1. A connector for joining coated optical fibres in end to end relationship, comprising;

a tubular connecting member having a bore of a size to slide on the coated optical fibres;

a preformed section in said tubular connecting member, said preformed section comprising a plurality of radially inwardly deformed portions, said deformed portions defining a plurality of lobes, and a central bore of a size to be a close fit on an uncoated optical fibre;

an inclined surface at each end of each radially deformed portion, each inclined surface extending from said bore of said connecting member to said central bore of said preformed section.

3,972,586

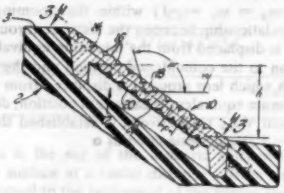
ROADWAY MARKER AND REFLECTOR THEREFOR

Robin A. Arnott, and John F. Domaracki, both of Windsor, Canada, assignors to International Tools (1973) Ltd., Windsor, Canada

Filed Aug. 19, 1974, Ser. No. 498,343
Int. Cl.² G02B 5/13
U.S. Cl. 350—106 9 Claims

1. A roadway marker comprising: a housing having a base for engagement with the surface of a roadway and a generally rectangular reflective wall for reflecting light from vehicles on the roadway; said reflective wall having a central plane extending at an acute angle from said base and being integrally formed with a plurality of spherical reflector elements arranged in side by side relationship, said spherical reflector elements each having its center located on said central plane with equal portions of said spherical reflector elements projecting from opposite sides of said central plane, said spherical reflector elements being arranged in adjacent horizontal rows extending parallel to the plane of said base with the spherical reflector elements in each row being staggered with respect to the spherical reflector elements in any adjacent row such that

the center of each spherical reflector element in one row is located mid-way between the centers of adjacent pairs of spherical reflector elements in adjacent rows, the portions of the spherical reflector elements projecting from one side of said central plane defining an outer light receiving surface of said reflective wall and the portions of the spherical reflector elements projecting from the other side of said central plane defining an inner light reflecting surface of said reflective wall such that a light ray striking a reflector portion along a radius of a reflector element on said light receiving surface will pass through the center of said reflector element to the inner surface of the reflector portion of said reflector element in the light receiving surface and be reflected back through the center of said reflector element, the surface of said reflective wall being formed with flat areas parallel to said central plane, said flat areas each being enclosed by a group of three spherical reflector elements, the acute angle of said central plane with respect to said base being about 35°, and the distance between each adjacent pair of said spherical reflector elements being less than the respective diameters of the spherical reflector elements, each of said spherical reflector elements thereby having a reflective operating arc from its center of 110°.

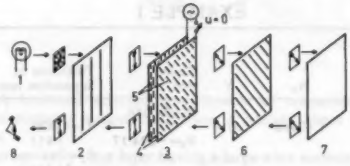


3,972,587

LIQUID CRYSTAL DISPLAY

Terry J. Scheffer, Wettingen, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Nov. 13, 1974, Ser. No. 523,452
Claims priority, application Switzerland, Dec. 21, 1973, 18015/73
Int. Cl.² G02F 1/13
U.S. Cl. 350—150 14 Claims



1. A laminar liquid crystal cell apparatus for controlling the transmission of light from a light source comprising:

a reflector;

a liquid crystal cell having transparent electrodes on opposite surfaces thereof, said cell containing liquid crystal molecules helically twisted through 45° about an axis normal to said electrodes, said liquid crystal cell positioned between said light source and said reflector;

a quarter-wavelength plate located between said liquid crystal cell and said reflector, and,

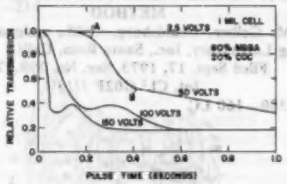
only a single polarizer located between said light source and said liquid crystal cell.

3,972,588

IMAGING METHOD

James E. Adams, Ontario; Gary A. Dir, Fairport, and Werner E. L. Haas, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 19, 1974, Ser. No. 498,799
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC 17 Claims



1. A method for transforming a liquid crystalline composition, comprising:

a. providing in the Grandjean texture between two electrodes a liquid crystalline composition comprising an optically active material and a nematic liquid crystalline material having dielectric negative anisotropy, said liquid crystalline composition capable of undergoing an electrohydrodynamic induced transformation to the focal-conic texture;

b. applying a first electrical field across said composition of a magnitude and for a duration of time sufficient to provide a first electrohydrodynamic induced transformation; and, without erasure of said first transformation,

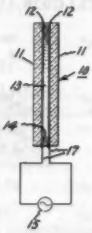
c. removing said first electrial field and within about 0.1 second after said removal, applying a second electrical field across said composition of greater magnitude than said first electrical field and for a duration of time sufficient to provide further electrohydrodynamic induced texture transformation of said liquid crystalline composition; wherein the extent of said further transformation is substantially greater than the sum of separately achievable transformations by said first and second electrical field applications with intervening erasure.

3,972,589

NEMATIC LIQUID CRYSTAL MIXTURES WITH STABLE HOMEOTROPIC BOUNDARY CONDITIONS AND METHODS OF MAKING THE SAME

David W. Skelly, Burnt Hills, and Gordon J. Sewell, Albany, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 265,794, June 23, 1972, abandoned. This application Jan. 7, 1974, Ser. No. 431,117
Int. Cl.² C09K 3/34; G02F 1/13
U.S. Cl. 350—160 LC 10 Claims



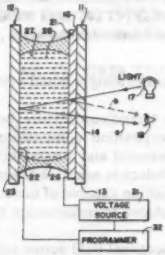
1. A nematic liquid crystal mixture characterized by a homeotropic boundary condition when formed in a thin layer, said mixture comprising a nematic liquid crystal and a mono-

polar additive selected from the group consisting of aliphatic mono-carboxylic acids and aliphatic nitriles, said additive being characterized by a concentration of between approximately 0.5% and approximately 5% by weight thereof completely dissolving in the nematic liquid crystal.

3,972,590
DISPLAY DEVICE WHICH CHANGES COLOR AND METHOD

Robert M. Geiber, Healdsburg, Calif., assignor to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Sept. 17, 1973, Ser. No. 398,175
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC **20 Claims**

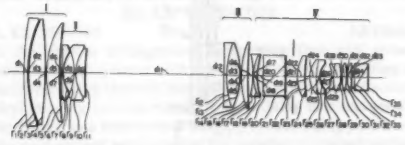


14. In a method for providing a visual display to the eye of a viewer utilizing energy from a light beam in the visible region comprising the steps of providing a liquid crystal material capable by activation of a change from a transparent optical state to a scattering optical state, establishing said liquid crystal material in an unactivated state, providing a dichroic filter, impinging said filter with a beam of incident light, whereby a first spectral portion of said incident light beam is reflected to said viewer, transmitting through said filter and said liquid crystal material a second spectral portion of said incident light beam, and reflecting at least a third spectral portion of said second spectral portion of light back through said liquid crystal material and said filter to said viewer, whereby the colored impression perceived by the viewer is the combination of said first spectral portion and said third spectral portion.

3,972,591
GREATLY VARIABLE MAGNIFICATION ZOOM LENS SYSTEM OF LARGE APERTURE RATIO

Michiharu Suwa, Fuchu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 326,749, Jan. 26, 1973, abandoned. This application Sept. 16, 1974, Ser. No. 506,128
Claims priority, application Japan, Feb. 1, 1972, 47-11707
Int. Cl.² G02B 15/16
U.S. Cl. 350—184 **5 Claims**



1. A greatly variable magnification zoom lens of large aperture ratio comprising lens group I of positive power, lens group II of negative power, lens group III of positive power and lens group IV arranged successively on the common optical axis whereby lens groups II and III are movable relative to lens group I to effect a continuous variation of magnification, said zoom lens system satisfying the conditions that the equivalent focal lengths and magnification powers of the lens groups, designated as fi, mi ($i = 1 - 4$) respectively, are defined by

$$0.24f_t > |f_2| < 0.25f_t$$

$$0.57f_t < f_3 < 0.59f_t$$

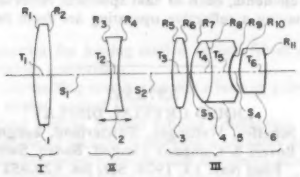
and when the equivalent focal length of the entire optical system varies from the minimum to the maximum with continuous variation in magnification, m_2 and m_3 not only increase in simple fashion, but coincide with each other at unity magnification (or $m_2 = m_3 = -1$) within the zooming region, whereby the relationship between the distance through which lens group II is displaced from the minimum equivalent focal length position to the coincidence position and the total distance through which lens group II is displaced from the minimum to maximum equivalent focal length position, designated as $V_{m2} = 1$ and V_{max} respectively, is established that in the ratio of $V_{m2} = 1 / V_{max.}$ designated as α

$$\alpha = 0.8$$

3,972,592
ZOOM PROJECTION LENS

Paul Lewis Ruben, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 18, 1974, Ser. No. 516,239
Int. Cl.² G02B 15/00, 3/04
U.S. Cl. 350—184 **1 Claim**



1. A zoom projection lens comprising six elements and having a focal length that varies from 15 to 30mm when constructed according to the following parameters:

EXAMPLE 1

Element	N_D	V	Radius mm	Thickness or Separation mm
1	1.49168	57.4	R_1=54.086	T_1=4.000
			R_2= −324.17	S_1= 1.911 to 25.018
2	1.49168	57.4	R_3=Asphere	T_2=1.600
			R_4=38.425	S_2= 24.114 to 1.007
3	1.49168	57.4	R_5=Asphere	T_3=3.631
			R_6= −28.253	S_3=0.100
4	1.49168	57.4	R_7=9.7250	T_4=5.000
			R_8= −21.155	
5	1.59028	30.9	R_9=7.2951	T_5=4.000
			R_{10}=15.403	S_4=1.932
6	1.60530	43.6		

T_6=6.000
R_{11}= −33.791

wherein, from front to rear, the elements are numbered from 1 to 6, the corresponding indices of refraction, N_D, and Abbe numbers, V, are listed for each element, the radii of curvature of the surfaces are numbered from R_1 to R_{11}, the thicknesses of the elements are numbered from T_1 to T_6, the spacings between the elements are numbered from S_1 to S_4, and wherein R_3 and R_5 represent the vertex radius of curvature of an aspheric surface defined by the following formula and parameters:

$$x = \frac{Cy^2}{1+\sqrt{1-(1+K)C^2y^2}}$$

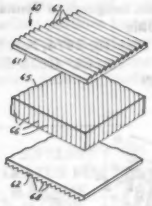
Surface	C	K
3	−.03504960	−2.41830036
5	.03137796	−9.89410310

wherein x is the sag of the aspheric surface from a plane reference surface at a radial distance y from the axis to the lens, c is equal to the reciprocal of the vertex radius of curvature and K is the conic constant.

3,972,593
LOUVERED ECHELON LENS

Roger H. Appeldorn, Grant Township, Washington County, and Raymond H. Anderson, St. Mary's Point, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 1, 1974, Ser. No. 484,619
Int. Cl.² G02B 3/08
U.S. Cl. 350—211 **19 Claims**



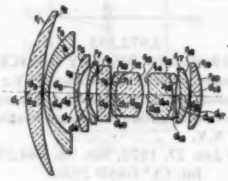
1. A louvered echelon lens capable of transmitting improved-contrast images comprising a unitary sheet that includes

1. an optically clear layer having a large-area surface configured as a linear echelon lens; and
2. an internally louvered layer superposed in optical connection with said clear layer and comprising an optically clear polymeric matrix and a set of thin light-absorbing linear louvers each supported within the matrix at an angle to the faces of the layer and aligned in spaced side-by-side relation so as to transmit light toward said configured surface while reducing light internally reflected within said lens; said louvers extending in a direction other than a direction that forms an angle of slightly greater than 0° up to 10° with the linear echelon lens elements so as to minimize moire patterns that arise because of juxtaposition of echelon lens elements and louvers.

3,972,594
RETROFOCUS-TYPE WIDE-ANGLE PHOTOGRAPHIC LENS SYSTEM

Nobuo Yamashita, Tama, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1974, Ser. No. 452,669
Claims priority, application Japan, Mar. 20, 1973, 48-32214
Int. Cl.² G02B 9/00
U.S. Cl. 350—214 **1 Claim**



1. A retrofocus-type wide-angle photographic lens system comprising nine lens components wherein a first lens component being a positive meniscus lens, a second, third and fourth lens components respectively being negative meniscus lenses, a fifth lens component being a positive lens, a sixth lens component being a cemented positive doublet lens, a seventh lens component being a cemented negative doublet lens, and an eighth and ninth lens components respectively being positive lenses, said retrofocus-type wide-angle photographic lens system having numerical data as given below and arranged to move a front lens group comprising said first and second lens components toward a rear lens group comprising said third through ninth lens components at the same time as the lens system as a whole is advanced:

Numerical data
f = 100, f_{NO} = 2.53f

r_1 = 193.18	d_1 = 24.59	n_1 = 1.6779	ν_1 = 55.33
r_2 = 352.41	d_2 = 0.55		
r_3 = 122.79	d_3 = 8.20	n_2 = 1.7859	ν_2 = 44.24
r_4 = 61.26	d_4 = Variable		
r_5 = 110.06	d_5 = 8.20	n_3 = 1.7859	ν_3 = 44.24
r_6 = 59.59	d_6 = 10.93		
r_7 = 110.79	d_7 = 5.46	n_4 = 1.7859	ν_4 = 44.24
r_8 = 58.86	d_8 = 10.93		
r_9 = 164.65	d_9 = 19.60	n_5 = 1.57501	ν_5 = 41.49
r_{10} = −932.08	d_{10} = 0.82		
r_{11} = 172.18	d_{11} = 5.46	n_6 = 1.6968	ν_6 = 55.62
r_{12} = 47.67	d_{12} = 38.40	n_7 = 1.5927	ν_7 = 35.54
r_{13} = −76.78	d_{13} = 8.74		
r_{14} = −140.51	d_{14} = 35.78	n_8 = 1.8044	ν_8 = 39.62
r_{15} = −71.22	d_{15} = 5.46	n_9 = 1.84666	ν_9 = 23.88
r_{16} = 340.15	d_{16} = 4.37		
r_{17} = −266.73	d_{17} = 14.59	n_{10} = 1.618	ν_{10} = 63.38
r_{18} = −76.40	d_{18} = 0.82		
r_{19} = −547.36			

$d_{10} = 15.57$ $n_{11} = 1.618$ $\nu_{11} = 63.38$
$r_{20} = -111.26$

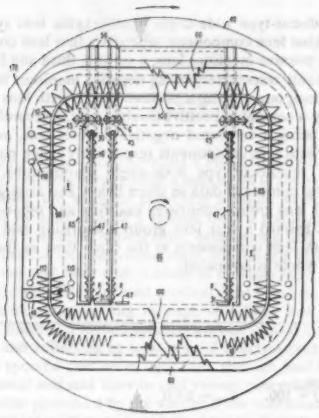
In the above, reference symbols r_1 through r_{20} respectively represent radii of curvature of respective surfaces of lenses, reference symbols d_1 through d_{10} respectively represent thicknesses of respective lenses and airspaces between lenses, reference symbols n_1 through n_{11} respectively represent refractive indexes for d-line of respective lenses, and reference symbols ν_1 through ν_{11} respectively represent Abbe's numbers of respective lenses.

3,972,595

FERROFLUID DISPLAY DEVICE

Lubomyr T. Romankiw, Briarcliff Manor, N.Y.; Marko M. G. Slusarczuk, Boston, Mass., and David A. Thompson, Somers, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 27, 1975, Ser. No. 544,593
Int. Cl.² G05D 25/00
U.S. Cl. 350—267 **9 Claims**



1. A display comprising

a first fluid and a second fluid substantially immiscible with said first fluid, said first fluid carrying a plurality of magnetic particles, means for emitting separate droplets of one of said fluids from a first space into a second space,

means for providing a rotating magnetic field,

magnetic means for propagating incremental step-by-step motion of said droplets from said means for emitting along a predetermined path in said second space, said magnetic means cooperating with said rotating magnetic field to provide one incremental step of motion for each rotation of said magnetic field.

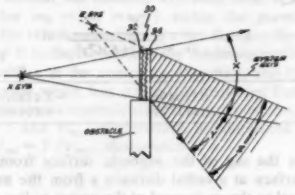
3,972,596

VIEW EXPANDING AND DIRECTING OPTICAL SYSTEM

John D. Baumgardner, and Dorothy J. Ebeling, both of Holland, Mich., assignors to Donnelly Mirrors, Inc., Holland, Mich.

Division of Ser. No. 252,611, May 12, 1972, Pat. No. 3,809,461. This application May 31, 1973, Ser. No. 365,514
Int. Cl.² G02B 5/04
U.S. Cl. 350—286 **15 Claims**

1. An optical system for vehicles for expanding and directing the field of view of a driver of the vehicle located within a vehicle, said system comprising in combination: at least one optical unit including a divergent lens and a prism having a specified angle of deviation of incident light rays, said lens and prism disposed in separate planes adjacent one another on said vehicle about a system axis comprising a line of sight extending from a specified eye position of the driver within said vehicle through said optical unit, said vehicle including a plurality of windows and having roof support posts and other structure generally to the rear of a driver when in position to drive each such vehicle, said posts and structure obstructing at least portions of the view of the driver generally rearwardly and to at least one side of the vehicle; said optical unit being mounted near one of said windows generally behind the driver's position; said lens and prism in combination shifting the virtual eye position of the driver viewing through said system to a point intermediate the distance between said specified eye position and said unit and away from said system axis; said unit providing an expanded and demagnified viewing area for the driver around said posts and structure generally rearwardly and laterally to one side of said vehicle; said divergent lens being an off-axis lens section having a predetermined degree of optical asymmetry determining expansion, demagnification and position of the viewing area of said lens to facilitate said rearward and lateral view.

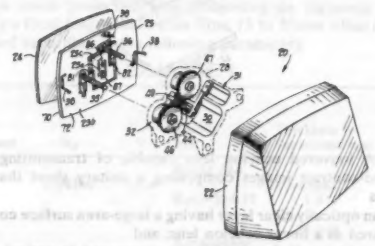


3,972,597

ELECTRICALLY ADJUSTABLE VEHICLE REAR VIEW MIRROR

Laszlo N. Repay, Chagrin Falls, and Thomas A. Young, Burton, both of Ohio, assignors to Tenna Corporation, Warrensville Heights, Ohio

Filed May 16, 1974, Ser. No. 470,569
Int. Cl.² G02B 5/08
U.S. Cl. 350—289 **15 Claims**



1. In a mirror assembly having a motor driven adjustable mirror and a housing for a motor and drive transmission, wherein two mirror adjusting screws are axially movable relative to and through rotation of two driven gears and gears are selectively driven by an electric motor and by a motor driven worm that extends generally axially from a drive shaft of the motor and that is selectively movable into engagement with one or the other of said gears, said motor, worm and gears being within the housing, the improvement comprising mounting means securing the motor against movement relative to the locations of the gears with the axis of the motor drive shaft oriented in a direction that extends between the two gears, a

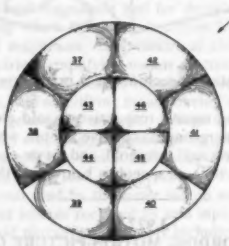
universal coupling between the motor drive shaft and worm that is axially short relative to the worm length permitting the worm to be moved angularly about a location on the motor drive shaft rotational axis, toward and away from the gears, and movable means coupled to the worm to move the worm angularly about said location relative to the motor.

3,972,598

MULTIFACETED MIRROR STRUCTURE FOR INFRARED RADIATION DETECTOR

Raymond J. Kunz, State College, Pa., assignor to Leco Corporation, St. Joseph, Mich.

Filed Sept. 9, 1974, Ser. No. 504,587
Int. Cl.² G02B 5/10
U.S. Cl. 350—293 10 Claims



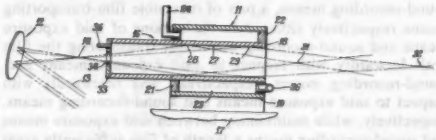
1. A multifaceted mirror for gathering infrared radiation from a plurality of discrete, spaced-apart fields of view, and reflecting the radiation to an infrared radiation sensing element, the mirror comprising a plurality of concave radiation gathering surface portions, wherein the improvement comprises each concave surface portion being oriented to gather and reflect infrared radiation from a predetermined field of view nonparallel to the axis of said concave surface and wherein the concave surface portions have focal points which are mutually spaced-apart and distant from the intended location of the infrared radiation sensing element whereby masking of the concave radiation gathering surfaces by the detector is avoided.

3,972,599

METHOD AND APPARATUS FOR FOCUSSING LASER BEAMS

Simon L. Engel, Sunnyvale, Calif., and Laurence R. Peters, Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 16, 1974, Ser. No. 506,451
Int. Cl.² G02B 5/10
U.S. Cl. 350—294 9 Claims



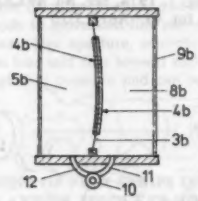
4. An apparatus for providing an elongated axial focus of a laser beam, comprising means for focusing the laser beam through a point and thence in a diverging manner, and an axicon having an active surface of substantially circular cross-section positioned to receive the diverging laser beam at one end thereof and focus said beam along an extended axis of given length beyond the other end thereof.

3,972,600

MIRROR WITH ADJUSTABLE FOCAL DISTANCE

Claus Christian Cobarg, Steinbach, Germany, assignor to Braun Aktiengesellschaft, Kronberg, Taunus, Germany

Filed Nov. 12, 1973, Ser. No. 414,980
Claims priority, application Germany, Nov. 15, 1972, 2255937
Int. Cl.² G02B 5/10
U.S. Cl. 350—295 3 Claims



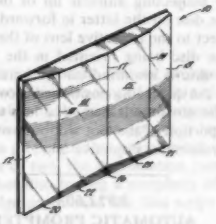
1. A mirror having an adjustable focal length, said mirror comprising the combination of an elongated, tubular frame member, a first pair of wall members closing the ends of said frame member wherein at least one of said first pair of wall members is transparent, a second, flexible wall positioned within said frame member and having at least one reflecting surface on at least a portion thereof, said reflecting surface portion being in opposition to said transparent one of said first pair of wall members, said second flexible wall dividing said frame member into separate chambers, conduit means communicating directly with both said chambers and a reversible pump in communication with said conduit means whereby the gas volumes in said chambers can be pumped from one to the other for selectively producing controllable pressures in said chambers.

3,972,601

PERIPHERAL VISION NON-DISTORTING REAR VIEW MIRROR

William Johnson, 8912 Nightingale Ave., Fountain Valley, Calif. 92708

Filed Aug. 19, 1974, Ser. No. 498,864
Int. Cl.² G02B 5/08
U.S. Cl. 350—303 7 Claims



1. A mirror having at least first and second opposite sides for providing complete peripheral non-distorted vision to said first side, comprising:

first and second plane mirror surfaces on said first side having at least first and second opposite edges, the first edges of said first and second plane mirror surfaces adjoining each other at a center line having first and second ends along said first edges, said first and second mirror surfaces sloping from said center line toward said second side at an angle of 2° to 3°;

a third plane mirror surface on said first side adjoining said first mirror surface at the second edge thereof and sloping toward said second side at an angle of 3° to 4°; and

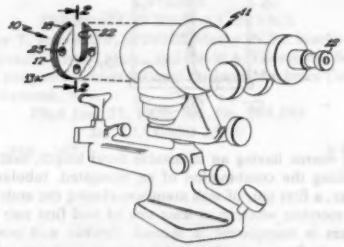
a fourth plane mirror surface on said first side adjoining said second mirror surface at the second edge thereof and sloping toward said second side at an angle of 3° to 4°.

3,972,602

AUXILIARY LENS HOLDER DEVICE FOR USE WITH A KERATOMETER

H. D. E. Inns, Brantford, Canada, assignor to Precision-Cosmet Company, Inc., Minneapolis, Minn.

Filed Aug. 1, 1974, Ser. No. 493,827
Int. Cl.² A61B 3/10
U.S. Cl. 351—6 3 Claims



1. A lens holder device for a keratometer including an eyepiece, a substantially circular front face plate having a centrally located objective lens therein, an annular lip projecting axially forwardly from the face pate, diametrically opposed pairs of mire signs on the face plate, said lens holder device comprising:

a generally flat circular disc.

a slot in the disc extending inwardly, in a general radial direction from the circumferential edge thereof beyond the center of the disc, said slot defining a U-shaped edge including side edge portions and an arcuate inner portion continuous with said side edge portions,

said U-shaped edge having a continuous inwardly opening groove therein, said slot being of the size to accommodate an auxiliary optical trial lens therein with the edge of the trial lens positioned in the groove,

said disc being of the size to permit the circumferential edge thereof to frictionally engage the inner surface of the forwardly projecting annular lip of the keratometer to mount the disc on the latter in forwardly spaced relation with respect to the objective lens of the keratometer, the slot in the disc being oriented in the vertical direction when the disc is mounted on the keratometer, with the groove in the disc being positioned forwardly of the annular lip, whereby an auxiliary trial lens seated in the arcuate edge portion of the slot will be centered with respect to the keratometer objective lens.

3,972,603

AUTOMATIC PROMPTER

William Lubinec, 22 Cornish Ave., Hillcrest, Binghamton, N.Y. 13901

Continuation-in-part of Ser. No. 292,853, Sept. 28, 1972, abandoned. This application Apr. 22, 1974, Ser. No. 462,732
Int. Cl.² G11B 15/18
U.S. Cl. 352—4 10 Claims

1. An automatic prompter for speakers comprising:

a. a housing having a window visible to the speaker;

b. a supply zone area adapted to receive a script to be read by such speaker;

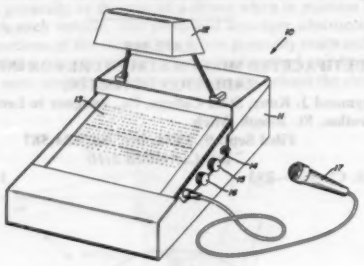
c. feed mechanism for engaging and moving said script progressively across said window;

d. take-up means for receiving said script after it has traversed said window;

e. a motor for driving said feed mechanism;

f. a microphone responsive to the speech of a speaker reading such script;

g. electronic circuitry responsive to the output signals from said microphone for amplifying and detecting those signals representing speech above a predetermined threshold;



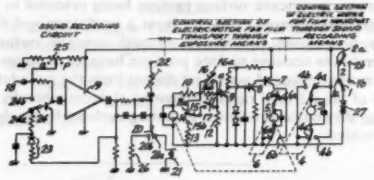
h. and switching means, responsive to said electronic circuitry for energizing said drive motor whenever said speech is above said threshold, and for de-energizing said motor whenever said speech is below said threshold.

3,972,604

SOUND-RECORDING MOTION-PICTURE CAMERA

Hirofumi Yoshimura; Toyonori Higuma, and Noriaki Itoo, all of Tokyo, Japan, assignors to Kabushiki Kaisha Yashica, Tokyo, Japan

Filed Sept. 30, 1974, Ser. No. 510,557
Claims priority, application Japan, Oct. 1, 1973, 48-109319
Int. Cl.² G03B 31/00
U.S. Cl. 352—14 7 Claims



1. In a sound-recording motion-picture camera, exposure means for exposing film as the latter is fed in a forward direction frame-by-frame in a stepwise manner past said exposure means, sound-recording means for receiving exposed film which travels in said forward direction beyond said exposure means and for recording sound on a sound track of said film while the latter travels in a continuous manner past said sound-recording means, a pair of reversible film-transporting means respectively situated in the regions of said exposure means and sound-recording means for transporting the film both forwardly with respect to said exposure means and sound-recording means, respectively, and rearwardly with respect to said exposure means and sound-recording means, respectively, while maintaining between said exposure means and sound-recording means a length of film sufficiently great to provide in the film between said exposure means and sound-recording means, at a predetermined location, a relaxed film loop from which the film can travel continuously to said sound-recording means while being fed in said forward direction to said predetermined location in a stepwise manner from said exposure means, and at least one of said film-transporting means including a variable speed electric motor, for determining the speed with which film is transported by said

one transporting means, detecting means for cooperating with the film loop at said predetermined location for detecting when the film loop becomes longer or shorter than a predetermined magnitude, said detecting means including a switch means situated at said predetermined location for directly engaging the film loop and for responding to a change in the length of the film loop, said switch means having one position when the film loop increases in length beyond said predetermined magnitude and another position when the film loop decreases in length beyond said predetermined magnitude, and electrical circuit means operatively connected with said detecting means for responding automatically to movement of said switch means thereof between said positions and electrically connected with said variable speed motor of said one transporting means for automatically changing, when said switch means changes its position, the speed of said motor, during forward and rearward travel of the film, to increase the length of the film loop when the latter becomes shorter than said predetermined magnitude and for decreasing the length of the film loop when the latter becomes longer than said predetermined magnitude, said electrical circuit means including an electrical amplifying means electrically connected with said variable speed electric motor of said one film-transporting means, said amplifying means having an input, generator means for generating an input voltage to be transmitted to said input, and electrically connected between said generator means and amplifying means a plurality of resistors electrically connected with said switch means of said detecting means to be controlled by the latter switch means for determining the input voltage received by said input of said amplifying means, said plurality of resistors including a plurality of separate, discrete resistors and said switch means being connected together with said plurality of discrete resistors between said generator means and amplifying means for changing the number of said plurality of discrete resistors effectively connected electrically between said generator means and amplifying means when said switch means changes between said positions thereof, for determining said input voltage in accordance with the number of resistors rendered effective by said switch means.

3,972,605

CINECAMERA

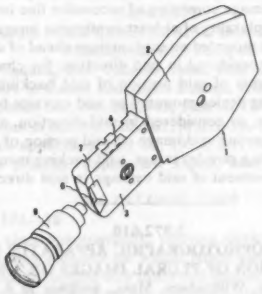
Marcel Beaulieu, Langon Mennetou sur-Cher, France, assignor to Beaulieu S.A, Romorantin Lanthenay, France

Filed Apr. 14, 1975, Ser. No. 567,856

Claims priority, application France, May 24, 1974, 74.18063

Int. Cl.² G03B *23/02*

U.S. Cl. 352—72 **3 Claims**



1. A silent camera for use with a film cartridge of the type having a cartridge aperture for exposing film with a movable cartridge film pressure pad adjacent thereto to bias the film toward said cartridge aperture and a cartridge recess spaced from said cartridge aperture across which the film passes, said camera comprising a body having a camera aperture for exposing film, said body being adapted to receive said cartridge with said cartridge recess positioned adjacent to and inwardly of said camera aperture, a lens mounted on said body adjacent and outwardly of said camera aperture, a movable camera film pressure pad adjacent to and inwardly of said camera aperture so positioned as to extend into said cartridge recess to be engagable with said film to bias said film toward said camera aperture when a cartridge is placed in said body, means engagable with said film cartridge pressure pad when a cartridge is placed in said body to move said film cartridge pressure pad away from said cartridge aperture, whereby said camera film pressure pad can bias said film toward said camera aperture and said cartridge film pressure pad can be held away from said film.

3,972,606

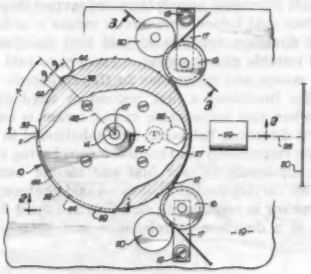
ADVANCEMENT OF FILM STRIPS OF DIFFERENT WIDTHS AND/OR SPROCKET HOLE SIZES

Wilton A. Stewart, and Ann M. Stewart, both of 16624 Linda Terrace, Pacific Palisades, Calif. 90272

Filed June 17, 1974, Ser. No. 479,908

Int. Cl.² G03B *1/24*

U.S. Cl. 352—79 **12 Claims**



1. In apparatus for advancing moving picture film strips having sequential sprocket holes spaced therein along the film strips length, and including the film strips respectively having different widths, sprocket hole sizes, sprocket hole locations and/or sprocket hole pitch spacings, which pitch spacings are not solely a multiple of two, the combination comprising

a. a rotary sprocket disc having a periphery of a width to support only edge portions of the film strips during film advancement,

b. a circumferential row of sprocket teeth carried by the disc to project outwardly from said periphery for entraining said film strips, at least one film strip entrained on the sprocket teeth, so as to project widthwise freely beyond an edge of said disc periphery and in unsupported relation, successive like teeth having pitch spacing greater than the sequential sprocket hole pitch spacings in each of said film strips, certain of said successive like teeth having center-to-center pitch spacing which is an integral multiple other than two of the pitch spacing of successive sprocket holes in each of said film strips,

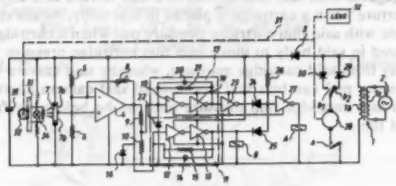
c. said center-to-center pitch spacing of said certain successive like teeth being about 1.50 inches or an integral multiple thereof.

3,972,607

ANALOG/DIGITAL CONTROL ARRANGEMENT FOR PHOTOGRAPHIC APPARATUS

Alois Reider, Munich, Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Dec. 30, 1974, Ser. No. 537,668
Int. Cl.² G03B 3/10, 7/10
U.S. Cl. 353—101 11 Claims



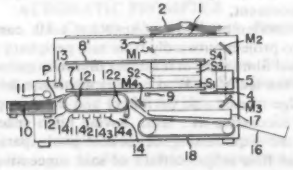
1. Photographic apparatus, comprising, in combination, photoelectric transducer means for furnishing a light-dependent signal varying as a function of light falling thereon; balanceable circuit means including said photoelectric transducer means for furnishing a first signal having an amplitude less than a predetermined first threshold amplitude when said balanceable circuit means is unbalanced in a first direction, an amplitude exceeding said predetermined first threshold amplitude and less than a predetermined second threshold amplitude when said balanceable circuit means is balanced, and an amplitude exceeding a predetermined second threshold amplitude when said balanceable circuit means is unbalanced in a second direction opposite to said first direction; first and second bistable circuit means connected to said balanceable circuit means and responsive to the amplitude of said first signal for furnishing a first, second or third digital output signal when said balanceable circuit means is unbalanced in said first direction, balanced, and unbalanced in said second direction respectively; and control means having an energizing circuit connected to said first and second bistable circuit means for varying the light falling on said photosensitive transducer means in response to said first and third digital output signals in a direction to rebalance said balanceable circuit means.

3,972,608

COLOR COPYING APPARATUS HAVING ONE OR MORE SCREEN-LIKE PHOTOSENSITIVE MEMBERS

Inao Moriyama, Ebina; Keiji Tanaka, Kawasaki; Yujiro Ando, Yokohama, and Katsunobu Ohara, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 30, 1974, Ser. No. 493,653
Claims priority, application Japan, Aug. 1, 1973, 48-87074; Aug. 1, 1973, 48-87075
Int. Cl.² G03G 15/01
U.S. Cl. 355—4 4 Claims



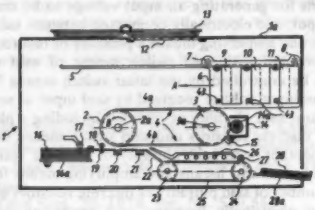
1. A color copying apparatus comprising a plurality of movable, flat photosensitive mediums each having a plurality of openings therein, image exposure means for exposing said photosensitive mediums to color images having color components of an original image, primary electrostatic image forming means cooperable with said image exposure means to form an electrostatic image on each of said photosensitive mediums, support means for movably supporting a charge-retaining member in non-contact relationship with said photosensitive mediums, secondary electrostatic image forming means for forming charge images on said charge-retaining member, said charge images corresponding to the electrostatic images on said photoconductive medium, and developing means having a plurality of developing units disposed adjacent said support means to impart predetermined color developer to develop said charge images.

3,972,609

ELECTROSTATIC COPYING MACHINE

Josef Pfeifer, Unterhaching; Günther Schnall, Eching, and Rudolf Eppe, Taufkirchen, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed May 1, 1975, Ser. No. 573,528
Claims priority, application Germany, May 4, 1974, 2421661
Int. Cl.² G03G 15/01
U.S. Cl. 355—4 14 Claims



1. In an electrostatic copying machine, a combination comprising a support for originals to be copied; a mobile conductive backing member having an external photosensitive surface and including a substantially flat portion spaced apart from and facing an original on said support; a carriage movable lengthwise of said flat portion intermediate said backing member and said support; means for moving said carriage; at least one exposing device mounted on said carriage and having a plurality of optical imaging components each including a plurality of lens elements and at least one light source for illuminating the original on said support so that said lens elements project onto the photosensitive surface of said portion of said backing member an image of the original on said support while said carriage is being moved in a predetermined direction, said image consisting of successive line images each composed of a plurality of at least contiguous image portions; a corona device mounted on said carriage ahead of said exposing device, as considered in said direction, for charging successive increments of said portion of said backing member; and a developing device mounted on said carraige behind said exposing device, as considered in said direction, and having means for converting said image on said portion of said backing member into a powder image, said backing member being idle during movement of said carriage in said direction.

3,972,610

ELECTROPHOTOGRAPHIC APPARATUS FOR PRODUCTION OF PLURAL IMAGES ON A SHEET

Frank C. Gross, Wilbraham, Mass., assignor to A. B. Dick/-Scott, South Hadley, Mass.

Filed Apr. 9, 1973, Ser. No. 349,452
Int. Cl.² G03G 15/00
U.S. Cl. 355—7 26 Claims

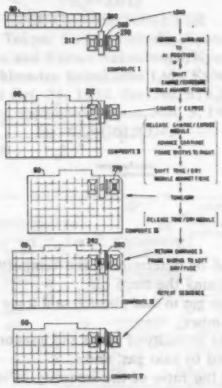
3. Electrophotographic apparatus for sequentially imaging

successive frames of a multi-frame photosensitive substrate which comprises:

i. a discrete charging/exposing station positioned on a predetermined path and comprising means for impressing a substantially uniform electrostatic charge on one of said frames of said multi-frame photosensitive substrate and means for exposing said charged frame to a radiation pattern to form a latent electrostatic image;

ii. a discrete processing station positioned on said predetermined path and comprising means for developing said latent electrostatic image;

iii. a second discrete processing station positioned on said predetermined path and comprising means for fixing said developed image;



iv. indexing means for changing the relative position of said substrate to said stations [i], [ii], and [iii], said indexing means performing a single advancing step which changes the position of the first frame from station [i] to station [ii] and performing a single returning step which both changes the first frame from the position of station [ii] to station [iii] and positions a second frame at station [i]; and

v. said station [ii] is positioned in the advancing direction along said predetermined path from said station [i] and said station [iii] is positioned in the returning direction from said station [ii] along said predetermined path so that a single indexing step presents the developed first frame to the fixing staion and the second frame to the charging/exposing station.

3,972,611

APPARATUS FOR TRANSFERRING IMAGES PRODUCED BY LIQUID DEVELOPER

Hiroshi Tanaka, and Takashi Saito, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

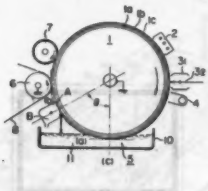
Division of Ser. No. 366,262, June 4, 1973, which is a continuation of Ser. No. 122,861, March 10, 1971, abandoned. This application July 15, 1974, Ser. No. 488,453

Claims priority, application Japan, Mar. 18, 1970, 45-22822

Int. Cl.² G03G *15/10*

U.S. Cl. 355—10 **12 Claims**

1. An electrophotographic copying device comprising an image-bearing member on which latent electrostatic images are formed, developed with toner and thereafter transferred to copying material, means for forming a latent electrostatic image on said image-bearing member, developer means for applying a liquid developer comprising a liquid carrier having a toner dispersed therein onto said image-bearing member to form a toner image of the latent electrostatic image formed thereon, a corona charging means for thereafter removing excess liquid developer and simultaneously increasing the attaching force of the toner image to said image-bearing member, means for causing relative movement between said corona charging means and said image-bearing member, transfer



means for transferring the toner image to copying material after removal of said excess liquid developer, and cleaning means for thereafter cleaning said image-bearing member for repeated use.

3,972,612

DUPLEX COPYING APPARATUS

Shigehiro Komori, Yokohama; Yoshitomo Goshima, Kawasaki; Hajime Katayama, and Koichi Miyamoto, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

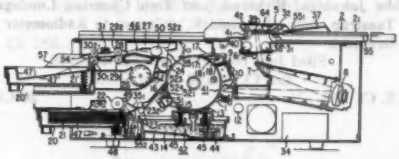
Continuation of Ser. No. 405,005, Oct. 10, 1973, Pat. No. 3,905,697. This application Jan. 28, 1975, Ser. No. 544,829

Claims priority, application Japan, Oct. 17, 1972, 47-103752

The portion of the term of this patent subsequent to Sept. 16, 1972, has been disclaimed.

Int. Cl.² G03B *27/32*, *27/52*, *27/62*

U.S. Cl. 355—26 **9 Claims**



1. A duplex copying machine adapted to produce images of an original on both sides of a copy paper comprising a housing, an original holder, an exposure slit, optical means for exposing a photosensitive member to an original image through said slit, copying processing means for forming said original image on one side of said copy paper, driving means for driving said copying processing means, means providing a copy paper feeding station and a discharging station, a first copy paper cassette detachably mounted at said copy paper feeding station for holding copy papers, means for feeding copy paper to said copying processing means from said first copy paper cassette when mounted at said feeding station, and a second copy paper cassette detachably mounted at said copy paper discharging station for receiving copy paper upside down, relative to the copy paper in said first copy paper cassette, after completion of a first copying process on one side thereof, said second copy paper cassette being also detachably mountable at said copy paper feeding station and said feeding means being operable to feed said copy paper to said processing means from said second cassette when mounted at said feeding station, whereby after said copy paper is received in said second cassette the positions of said first and second copy paper cassettes are reversed and another copying process is conducted to thereby obtain a copy paper having original images on both sides.

3,972,613
COPYBOARD

John D. Plumadore, Westfield, Mass., assignor to Scott Paper Company, Philadelphia, Pa.

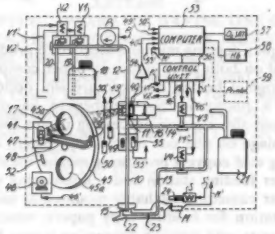
Filed Apr. 23, 1975, Ser. No. 570,879
Int. Cl.² G03B 27/62
U.S. Cl. 355—75 1 Claim

1. In an apparatus for electrophotographically recording information from a document on a film, comprising a transparent copyboard having one side upon which the document is placed, light means on the opposite side of the copyboard from said one side for illuminating the document placed on the copyboard, mirror means for directing the light image reflected from the document to the film, and lens means for focusing the light image on the film, the improvement in the copyboard comprising:
   a white border extending around the perimeter of the copyboard on the light means side of the copyboard; and
   a dark border extending around the inside perimeter of the white border and on the document side of the copyboard.

3,972,614
METHOD AND APPARATUS FOR MEASURING ONE OR MORE CONSTITUENTS OF A BLOOD SAMPLE

Ebbe Johansen, Birkerod, and Finn Chresten Lundsgaard, Taastrup, both of Denmark, assignors to Radiometer A/S, Denmark

Filed July 10, 1974, Ser. No. 487,368
Int. Cl.² G03B 27/76, 27/52
U.S. Cl. 356—36 20 Claims

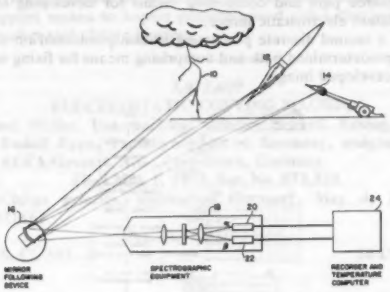


1. An apparatus for hemolyzing a blood sample and for measuring at least one constituent thereof, said apparatus comprising:
   a. a conduit for conducting said blood sample and including a hemolyzing section,
   b. means for generating ultra-sonic waves in walls defining said hemolyzing section so as to at least partly hemolyze a blood sample contained therein,
   c. means for measuring said constituent on the hemolyzed blood sample within said hemolyzing section, and
   d. means for subsequently flushing the blood sample out of said conduit.

3,972,615
DETERMINATION OF SEMI OPAQUE PLASMA TEMPERATURES

Robert D. Hill, Santa Barbara, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 17, 1975, Ser. No. 541,957
Int. Cl.² G01J 5/60
U.S. Cl. 356—45 4 Claims

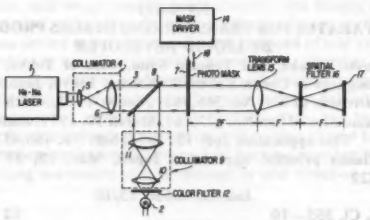


1. A method of determining the temperature of gaseous plasmas comprising the steps of:
   adding a trace gas to said plasma, said trace gas having a low atomic number;
   measuring the intensity of a first and a second spectral series line emitted by said gas; and
   determining the ratio of the intensity of said first spectral series line to the intensity of said second spectral series line, wherein the ratio of the intensities is representative of the temperature of the plasma.

3,972,616
APPARATUS FOR DETECTING THE DEFECTS OF THE MASK PATTERN USING SPATIAL FILTERING

Masana Minami, Kawasaki, and Hidekazu Sekizawa, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed June 27, 1975, Ser. No. 590,933
Claims priority, application Japan, Sept. 9, 1974, 49-102993
Int. Cl.² G06K 9/08; G01N 21/16, 21/32
U.S. Cl. 356—71 10 Claims



1. Apparatus for detecting defects of an object having linear straight line features and nonlinear defects comprising:
   a coherent light source for emitting coherent light;
   an incoherent light source for emitting incoherent light;
   a first collimator for collimating said coherent light to a prescribed light thickness;
   a second collimator for collimating said incoherent light to a prescribed light thickness;

means for irradiating coherent light passed through said first collimator and incoherent light passed through said second collimator on the same optical axis to said object;

a transform lens for transforming the intensity distribution of permeated light or reflected light of said object into a Fourier-transform pattern;

a spatial filter located on the Fourier-transform plane of said transform lens, and for preventing the passing of coherent light having information of said linear straight line features of said object; and

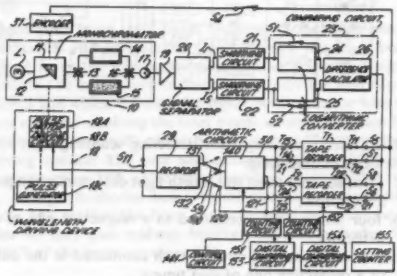
means for projecting a coherent image and an incoherent image respectively passed through said spatial filter on one another.

3,972,617

SPECTROPHOTOMETER

Kazuo Shibata, Tokyo; Yoshio Fukuda, Kyoto; Michinosuke Takada, Kyoto, and Katsuo Nakanomyo, Kyoto, all of Japan, assignors to Shimadzu Seisakusho Ltd., Kyoto, Japan

Filed Oct. 31, 1974, Ser. No. 519,673
Claims priority, application Japan, Nov. 5, 1973, 48-124258
Int. Cl.² G01J *3/42*
U.S. Cl. 356—88 **9 Claims**



1. A spectrophotometer comprising: means for providing monochromatic light; a pair of first and second cells; means for projecting said monochromatic light into said first and second cells so that a first and a second light beam issue from said first and second cells; means for receiving said first and second beams to produce corresponding first and second electrical signals; means for comparing said first and second electrical signals; magnetic recording means including a plurality of magnetic recording media for recording the output from said comparing means and means for driving said recording media independently of each other; means for reading out from each of said magnetic recording media control signals recorded thereon; means for comparing said control signals and controlling said driving means as a function of the comparison; means connected to the output of said magnetic recording means and the output of said electrical signal comparing means to perform predetermined mathematical operations thereon; and means for recording the output of said mathematical operation means.

3,972,618

INTERFEROMETER FOR TESTING MATERIALS OF DIFFERENT SIZES

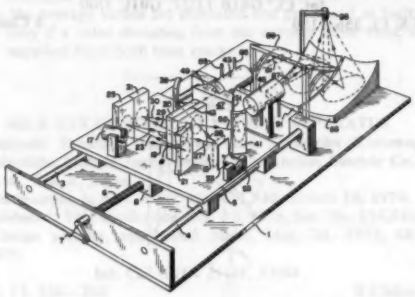
Roland C. Hawes, Monrovia, Calif., assignor to UTI-Spectrotherm Corporation, Santa Clara, Calif.

Filed Nov. 18, 1974, Ser. No. 524,649
Int. Cl.² G01B *9/02*; G01N *21/16*
U.S. Cl. 356—106 R **6 Claims**

1. An optical system for examining material, comprising:

means including a first optical system for forming two spaced apart electromagnetic energy illuminating beams having axes parallel to one another and each brought to a point focus that is fixed with respect to the first optical means, thereby to form two point foci that remain fixed at a given distance apart from each other,

means including a second optical system for imaging two points in space said fixed distance apart onto at least one electromagnetic energy detector, and



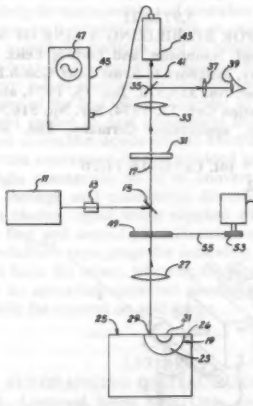
means maintaining the fixed focus of said two parallel beams fixed for moving said first and second optical means with respect to each other in a straight line direction parallel to said focused beams and through a distance that includes a coincidence of each of the point foci of said two beams with one of said two points in space, whereby difference sized materials may be positioned in the path of said parallel beams and an output beam therefrom accurately focused onto said detecting means.

3,972,619

METHOD AND APPARATUS FOR SURFACE ANALYSIS

Dennis Wakefield Stevens, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Aug. 11, 1975, Ser. No. 603,375
Int. Cl.² G01N *21/40*
U.S. Cl. 356—118 **11 Claims**



4. Apparatus for measuring anisotropy in the reflectivity within a region of a surface, comprising, means for directing a beam of coherent polarized light at the region on the surface, means for directing the reflected light beam through a polarizing filter, means for rotating the polarization directions of both the incident and reflected portions of the beam, and means for detecting the intensity of the light passing through said polarizing filter.

3,972,620

AZIMUTH ANGLE MEASURING APPARATUS

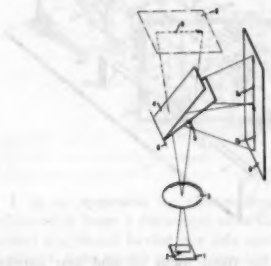
Hans Georg Nauth, Mainz, Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 11, 1975, Ser. No. 612,611

Claims priority, application Germany, Oct. 12, 1974, 2448743

Int. Cl.[2] G01B 11/27; G01C 1/00

U.S. Cl. 356—150 5 Claims



1. An optical device for measuring the angular difference between a line and a reference direction on an object plane comprising:

a. a mirror mounted to an axis perpendicular to the reference direction;

b. a beam splitter mounted on the same axis as said mirror at a different angle therefrom; and

c. means for imaging said line from said object plane onto said beam splitter and said mirror;

d. wherein said angular difference between said mirror and said beam splitter reflects said line such that the axial distance of a first end of the line imaged by said beam splitter is reflected to an image plane adjacent to a second end of the line reflected by said mirror, the lateral distance between line images being proportional to the angle between the line and the reference direction.

3,972,621

APPARATUS FOR STABILIZING A LINE OF SIGHT

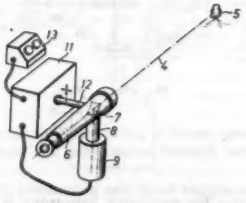
Hermann Eisenkopf, Naunheim, and Ludwig Leitz, Wetzlar, both of Germany, assignors to Ernst Leitz G.m.b.H.

Continuation of Ser. No. 323,376, Jan. 15, 1973, abandoned. This application Oct. 22, 1974, Ser. No. 516,956

Claims priority, application Germany, Jan. 18, 1972, 2202175

Int. Cl.[2] G01B 11/26

U.S. Cl. 356—152 8 Claims



1. An apparatus for stabilizing the line of sight between an object and an optical viewing system which move relative to one another comprising:

an optical grating (3',3'') to receive light from said line of sight (4) and to optically correlate a spatial frequency component present in an extended image structure of said object (5, 16);

electrical generating means (27 - 30) responsive to the light received from said grating to generate electrical signals proportional to the magnitude and direction of any relative movement of said optical axis of said line of sight (4) and said object (5, 16); and

means (11) responsive to said electrical signals to actuate means (12) for displacing said optical viewing system so as to counteract the relative deviation movement.

3,972,622

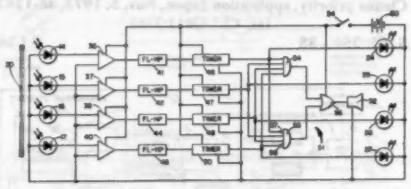
ELECTRONIC SURVEY TARGET

Mark T. Mason, South Lyndeboro, and Michael L. Bourgoine, Jaffrey, both of N.H., assignors to New Hampshire Ball Bearings, Inc., Peterborough, N.H.

Filed Sept. 19, 1974, Ser. No. 507,461

Int. Cl.[2] G01B 11/26; G01C 15/02

U.S. Cl. 356—172 1 Claim



1. An electronic target for detecting scanning light reference beams comprising:

a. First, second, third and fourth light detectors arranged in a fixed row;

b. four timers each connected to a respective one of said detectors;

c. four light-emitting devices each connected to the output of a respective one of said timers;

d. logic means connected to the output of said timers to provide an output signal responsive to either reference beam acquisition by all four of said detectors or only the second and third of said detectors;

e. a sonic indicator connected to said logic means and driven thereby to provide said output signal audibly, repeating at the scan cycle rate of the reference beam, said light-emitting devices serving to indicate the direction of misalignment in the absence of said output signal; and,

f. a housing containing all said light-emitting devices, light detectors, timers, logic means and sonic indicator, said light detectors lying behind a first aperture in said housing behind an optical bandpass filter and all said light-emitting devices lying behind a second aperture in said housing, said second aperture lying in a plane perpendicular to said first aperture.

3,972,623

LASER REFERENCE DEVICE

Yoshiaki Funayama, Yokohama, Japan, assignor to Nihon Zemu Co., Ltd., Tokyo, Japan

Filed Oct. 18, 1974, Ser. No. 515,863

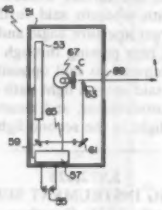
Claims priority, application Japan, Sept. 6, 1974, 49-101948

Int. Cl.[2] G01B 11/26

U.S. Cl. 356—172 1 Claim

1. In combination, a beam sender 45 including a laser beam source 53 for radiating a laser beam and a scanner 67 for scanning the laser beam radiated from said laser beam source, said scanner 67 including a mirror holder 75 and mirrors 77, 79 held on opposite surfaces of said mirror holder rotatably supported in the path of the laser beam by a pair of space

bearings 71, 73 and rotatable about an axis 69 with said bearings being spaced apart from each other as far as possible for reducing the deflection of the radiated laser beam from a plane normal to said axis due to the play in the bearing, a working lorry, a screed 7 towed by said working lorry, a pair of screed adjusting arms 11, 11' each connected at one of their ends to said screed, said working lorry including means 19, 19' for raising and lowering the other ends of said adjusting arms to increase or decrease the incline of said screed, a cross beam 25 mounted on and extending across said adjusting arms, a beam receiver 47 mounted at one end of said cross beams to detect the height of the screed above or below the



radiated laser beam, said beam receiver 47 including sensor elements 95–103 for receiving and sensing the laser beam radiated from the aforesaid beam sender 45, and a signal generator 118 responsive to the signals from the said sensor elements and which transmit the signal in accordance with the sensor element receiving the laser beam, a monitor device 154 provided independently of the beam receiver 47 comprising a receiving section 155 and an indicating section 157, said receiving section 155 including at least two photo-diodes 165, 167, said photo-diodes being connected to said indicating section 157 so that the laser beam radiated from the beam sender 45 may pass midway between the photo-diodes 165 and 167 of the beam receiver 155.

3,972,624
PROCESS AND APPARATUS FOR DETECTING LONGITUDINAL FAULTS ON MOVING WEBS OF MATERIAL

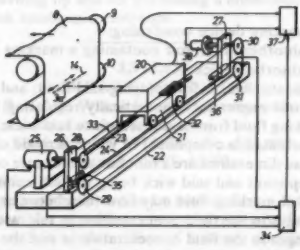
Hans Joachim Klein, Wuppertal; Manfred Rupprecht; Heinz Wonneberg, both of Leverkusen, and Julius Geiger, Odenthal-Gloebusch, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Dec. 11, 1974, Ser. No. 531,682

Claims priority, application Germany, Dec. 20, 1973, 2363422

Int. Cl.² G01N 21/32

U.S. Cl. 356—200 **13 Claims**



1. A process for detecting and localising longitudinally orientated faults on moving webs, in which the web is scanned optically line by line trasversely to its direction of movement and read by reflection, wherein:

a. the scanning line is reciprocated transversely over the whole web at a constant velocity,

b. the instantaneous value of the reflected signal is interrogated periodically at two fixed time marks within the scanning line during a predetermined number of scannings which make up a scanning cycle and stored and the values obtained in the course of a scanning cycle are averaged separately for both time marks, and

c. the average values are indicated and processed as faults only if a value deviating from the average noise value is supplied from both time marks.

3,972,625
MILK FAT CONTENT-MEASURING APPARATUS

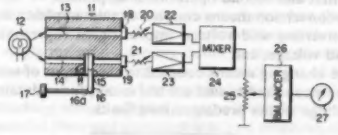
Yoshiyuki Takahasi, Kanagawa, and Shigenobu Kawawa, Machida, both of Japan, assignors to Anritsu Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 451,932, March 18, 1974, abandoned. This application Oct. 21, 1975, Ser. No. 624,544

Claims priority, application Japan, Mar. 31, 1973, 48-36875

Int. Cl.² G01N 21/22, 33/04

U.S. Cl. 356—206 **8 Claims**



1. A milk fat content-measuring apparatus which comprises a source of light; an optical guide having at least first and second light passageways for guiding light delivered from the source of light; a cuvette provided in the first light passageway of the optical guide so as to conduct the fat of a milk sample being examined; an optical correction device received in the first light passageway adjacent to the cuvette, formed of an open window and at least one optical correction window including at least one transparent glass plate over which there are uniformly formed a number of scratches each having such a dimension as is capable of giving an optical result corresponding to milk fat particles, and so constituted as to cause these windows to be selectively aligned with the first light passageway; a first photoelectric conversion device disposed at the outlet of the first light passageway so as to convert the source light guided by said passageway through the cuvette and optical correction device into an electric signal; a second photoelectric conversion device provided at the outlet of the second light passageway so as to convert the source light traveling through said passageway directly into an electric signal; an electric signal mixer supplied with output signals from the first and second photoelectric conversion devices; and an indication type gauge for indicating a value based on an output from the mixer, whereby the measuring apparatus can have its operation corrected accurately to show a prescribed milk fat content on said gauge.

3,972,626
AUTORANGING DIGITAL LUXMETER

Edward L. Laskowsi, Seven Hills, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed June 17, 1975, Ser. No. 587,602

Int. Cl.² G01J 1/44

U.S. Cl. 356—226 **6 Claims**

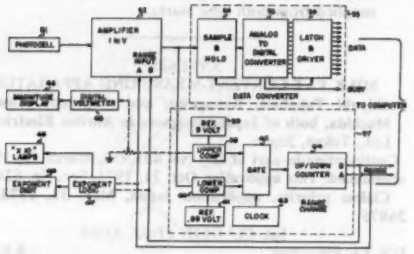
1. A digital luxmeter capable of operating on-line with a computer comprising:

photocell means for converting incident light into electric current;

amplifier means connected to said photocell for converting said current to a voltage, said amplifier means comprising:

a first operational amplifier, having first controllable feedback means, connected to said photocell,

a second operational amplifier, having second controllable feedback means, connected to the output of said first operational amplifier, and



control means connected to said first and second controllable feedback means for varying the feedback of said first and second operational amplifiers;

data conversion means coupled to said amplifier means for converting said voltage into a digital representation of said voltage; and

range changing means coupled to the output of said amplifier means and to said control means for maintaining said voltage within predetermined limits.

3,972,627

APPARATUS FOR INVESTIGATING FAST CHEMICAL REACTIONS BY OPTICAL DETECTION

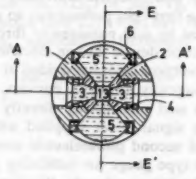
Carl-Roland Rabl, Gottingen, Germany; Rudolf Rigler, Stockholm-Danderyd, Sweden; Thomas J. Jovin, Schloss Berlepsch, Germany; Hermann Bründl, Bodenfelde, Germany, and Wolfgang Simm, Rosdorf, Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Germany

Filed July 11, 1974, Ser. No. 487,592

Claims priority, application Germany, Dec. 19, 1973, 2363180

Int. Cl.² G01N *21/24*

U.S. Cl. 356—246 **15 Claims**



1. An apparatus for investigating the course of fast chemical reactions by optical detection, said reactions being initiated in a chemical system under investigation by an external perturbation,

said apparatus comprising a first light path for conveying a probing light beam, said first light path comprising a light source, means for monochromatic light filtering, collimating and focusing elements, a beam divider to provide a reference beam and a probing beam, and at least one photodetector, said apparatus further comprising a second light path for conveying a sensing light beam, said second light path intersecting said first light path within a region of intersection, said probing light beam being focused onto said region of intersection, said apparatus further comprising means for supporting a sample cell at said region, said sample cell forming a chamber for holding a liquid sample of said chemical system,

said sample cell having two opposite windows and at least one further window, said windows having plane inner surfaces, said two opposite windows being transversed by said first light path and said further window being transversed by said second light path and the cross section of said chamber acting nearly completely as said region of intersection; said further window having a convexly curved outer surface forming a collecting lens, and the cross sectional area of said further window tapering from said lens surface towards said chamber; a further lens element close to said further window positioned in said second light path wherein said further window has a considerably larger aperture angle and a larger refractive power for light rays passing through the center of said chamber as compared to said opposite windows in said first light path, said second light path further comprising at least one photodetector, and means for spectral light filtering of the light in the second light path.

3,972,628

WRITING INSTRUMENT SUPPORT

Robert Glenn Stevers, 8521 Crenshaw, Inglewood, Calif. 90305

Filed Sept. 8, 1975, Ser. No. 611,518

Int. Cl.² B43K *23/00*

U.S. Cl. 401—48 **5 Claims**

1. A hand writing aid for use with writing instruments such as pens and pencils used for writing on substantially flat writing surfaces comprising:

a. a base adapted to rest upon the writing surface;

b. an upwardly extending member carried by said base and adapted to be gripped by the writer, said member including an angularly extending top wall to supportably carry the writing instrument; and

c. gripping means for positioning the writing instrument on said top wall with the writing point thereof in engagement with the writing surface.

3,972,629

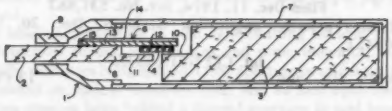
MARKING DEVICES

John J. Whalen, Jr., 63 Maple Place, Amityville, N.Y. 11701

Filed June 3, 1975, Ser. No. 583,471

Int. Cl.² B43K *5/00*, *7/00*

U.S. Cl. 401—199 **10 Claims**



1. A marking device comprising:

a. an absorbent reservoir containing a marking fluid;

b. an absorbent wick;

c. applicator means for applying said fluid; and

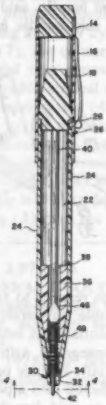
d. control means for automatically regulating the flow of marking fluid from said reservoir to said wick, comprising an actuator, a component of which is made of a material whose dimensions are a function of moisture content, said component and said wick being in fluid communication, so that marking fluid may flow therebetween and so that changes in the fluid concentration in said wick results in changes in the fluid concentration in and the dimensions of said component, whereby a decrease in the fluid concentration in said wick below a predetermined level causes fluid to flow from said reservoir to said wick to return the fluid concentration in said wick to said predetermined level.

3,972,630

WRITING IMPLEMENT

Richard Schenk, White Plains, N.Y., assignor to Stacie Pen Corporation, Brooklyn, N.Y.

Filed Apr. 16, 1975, Ser. No. 568,402
Int. Cl.² B43K 7/02
U.S. Cl. 401—217 7 Claims



1. A non-retractable writing implement comprising:

an elongate cartridge for containing a liquid ink supply and having a point assembly at one end thereof with a substantially cylindrical writing tip;

an elongate cylindrical barrel having a longitudinal bore completely therethrough receiving said cartridge, said bore having at one end thereof a polygonal cross-section for receiving said writing tip, the minimum cross-sectional diameter of said bore at said one end being no more than substantially equal to the substantially circular cross-sectional diameter of said writing tip, the walls of said barrel defining said polygonal cross-section being substantially smooth and having a sufficient flexibility for receiving said writing tip and the inwardly facing surfaces of said walls for engagement with and preventing lateral movement of said writing tip, the non-engagement portions of said surfaces providing air passageways in communication with the interior of said bore for venting said cartridge;

and an end plug for tightly sealing the other end of said elongate barrel so as to prevent air flow therebetween wherein said end plug has a substantially flat end for non-sealingly engaging the end of said cartridge opposite said writing tip and for permitting a controlled venting of the ink inside said cartridge.

3,972,631

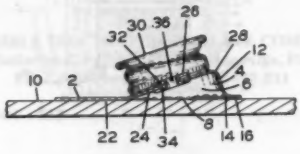
ADHESIVE APPLICATOR

Raymond B. Huber, Willow Street, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed June 11, 1975, Ser. No. 585,801
Int. Cl.² A47L 13/30
U.S. Cl. 401—261 5 Claims

1. An applicator adapted to be mounted on a material-supply container for spreading upon a working surface, with a drawing action, a uniform film of a heavy consistency fluid material issuing from the container, said applicator comprising a two-piece structure having no movable parts and including:

a. a rigid main body portion comprising a single piece of normally flat sheet metal having a top surface and a bottom surface, said body portion including a completely open bottom material-receiving chamber formed therein and extending upwardly from the bottom surface of the sheet, said material-receiving chamber having side walls, the bottom edges of which terminate in a single plane so that they contact the surface receiving the material from the supply container when the applicator is in use, said receiving chamber also having a front wall with a bottom edge at least a portion of which terminates in spaced relation to a material-receiving surface when the bottom edges of the side walls are in contact therewith to provide a single material-metering outlet in the applicator; and



b. means on said body portion for attachment of the applicator to an appropriate material-supply container, said attaching means adapted to permit the flow of said fluid material from said container into said receiving chamber.

3,972,632

EXPANDABLE BOOK COVER

Leewood C. Carter, Warren Township, Somerset County, N.J., assignor to Book Covers, Inc., Newark, N.J.

Filed Mar. 11, 1975, Ser. No. 557,335
Int. Cl.² B42F 13/12
U.S. Cl. 402—46 1 Claim

1. An expandable cover and a book of materials, such as data processing sheets, accounting records, and the like, comprising:

a pair of leaf boards overlying the front and back sides of said book forming the front and back covers of said book,

case made folded cloth members adhesively joined to both the inside and outside of the inner ends of said cover boards and extending beyond them in spaced relationship,

a pair of corner members adhesively secured on their inside and outside to said cloth members and spaced slightly from the inner ends of each of said cover boards to thereby hingedly join said cover boards to said corner members, said cloth members extending on both sides of said corner members and beyond them around the corners of said book in spaced relationship,

means secured to each of said corner members and extending through said book for adjusting the spacing between the corner members,

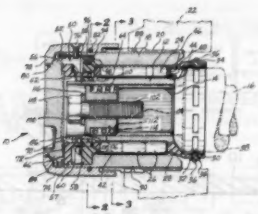
a pair of spine protecting and covering elements each comprising a pair of members separated at their edges adjacent the front and back of said book by narrow spacer strips joined to said pair of members to define an extensive opening between each of said members, said cloth members being adhesively connected to the outsides of each of said pair of members to join said pair of spine protecting and covering elements to said pair of corner members; and

an element slidably positioned and received in said openings to completely cover and protect the spine of said book and permitting adjustment of the spacing between said front and back covers.

3,972,633
WHEEL HUB ASSEMBLY

Allen J. Wright, Portland, Oreg., assignor to Warn Industries, Inc., Kent, Wash.

Filed Feb. 27, 1975, Ser. No. 553,567
Int. Cl.² B60B *27/00*; F16D *1/06*
U.S. Cl. 403—1 **31 Claims**



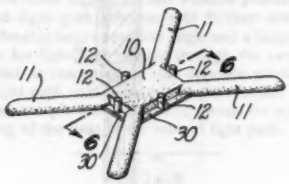
1. A hub assembly, comprising:
a. an inner hub member adapted to be connected to a drive axle for rotation therewith and having outwardly facing inner clutch cam surfaces;
b. an outer housing adapted to be connected to a wheel for rotation therewith and having an inwardly facing outer clutch surface;
c. a clutch assembly comprising:
1. a plurality of wedging clutch elements mounted between the hub member and the housing movable between an engaged position between the inner cam surfaces and the outer clutch surface, and a release position where said housing is disengaged said hub member;
2. a cage means for positioning said clutch elements between the hub member and the housing;
d. a clutch lock means having a first unlocked position in which the clutch assembly is movable between its engaged position and its release position, and a second lock position which it interconnects the cage means with the housing and brings the hub member and the housing into constant clutching engagement;
e. lock shifting means comprising a movable interconnecting means between the clutch lock means and at least one of the hub member and the housing which provides for limited relative rotational movement between the hub member and the housing while maintaining the lock position of said clutch lock means.

3,972,634
COMBINED INSERT AND END PLUG FOR FIBERGLASS TOOL HANDLES

Joseph Allen Carmien, Beverly Hills, and John R. Yuhos, Van Nuys, both of Calif., assignors to Nupla Corporation, Sun Valley, Calif.

Continuation-in-part of Ser. No. 473,723, May 28, 1974, Pat. No. 3,879,145, and a continuation-in-part of Ser. No. 473,724, May 28, 1974, Pat. No. 3,917,421. This application Nov. 12, 1974, Ser. No. 523,052
Int. Cl.² B25G *3/00*; F16D *1/00*; F16G *11/00*
U.S. Cl. 403—13 **4 Claims**

1. An insert for use in attaching a tool handle of fiberglass or the like to a tool head having a handle receiving opening, said insert being adapted to hold said handle temporarily in a fixed position with respect to said tool head during the curing of potting compound within said opening which forms a permanent bond between said handle and tool head, said insert being formed of a single piece of molded resilient material, said insert comprising a flat solid center portion having a peripheral configuration substantially corresponding to the peripheral configuration of the head carrying end of said handle, and a plurality of legs each connected at one end thereof to said center portion, said legs extending radially outwardly from said center portion in the same plane as said center portion prior to insertion of said insert into said handle receiving opening, said insert being movable into said opening by the end of said handle when said handle is inserted into said opening, said legs engaging the inner walls of said opening and being bent at a right angle along the area of their connection to said center portion, so that said legs extend parallel to said handle between the inner side walls of said opening and the outer side walls of said handle, said legs resiliently engaging the adjacent sides of said handle and opening to hold said

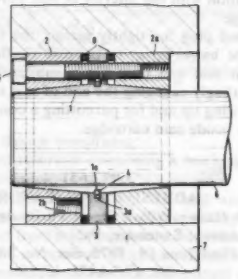


handle in position with respect to said tool head, said center portion having a flexible outwardly directed membrane extending around substantially its entire periphery, said membrane being formed integrally with said center portion and comprising a substantially thinner portion thereof, said membrane adapted to be flexed into a position wherein it extends substantially parallel to said handle when said handle and insert are inserted into said opening, said membrane being adapted to flex outwardly by its own resilience when said insert is disposed within the outer end of said opening, whereby said center portion and membrane combine to form a complete cover for the outer end of said opening.

3,972,635
DOUBLE CONICAL HUB-TO-SHAFT CONNECTION

Oskar Erich Peter, Brackenheim, and Lothar Peter, Guglingen, both of Germany, assignors to Oskar Erich Peter, Brackenheim, Germany

Filed July 3, 1975, Ser. No. 592,923
Claims priority, application Germany, Apr. 3, 1975, 2514510
Int. Cl.² F16D *1/06*
U.S. Cl. 403—13 **5 Claims**



1. Double conical hub-to-shaft connection to connect a shaft element (6) to a hub element (7) comprising
an inner ring (1) having inner cylindrical surfaces seating on the shaft (6) and outer double conical surfaces;
two outer rings (2, 2a) having outer cylindrical surfaces seating in the hub (7) and inner conical surfaces seating on the respective outer conical surfaces of the inner ring (1),

and the outer rings being formed with axial bores to receive clamping bolts (5) tending to tighten the outer rings axially towards each other and thus move the conical surfaces over each other, the outer rings having greater cross-sectional area than the inner ring to accept said bores and clamping bolts;

characterized in that

the double conical ring is formed with a circumferential groove (1*a*) at the zone intermediate its length;

a centering ring (3) is provided located between the outer ring (2, 2*a*) and having an outer cylindrical surface bearing against the hub (7), the centering ring being formed with a circumferential ring groove (3*a*) matching the groove (1*a*) in the double conical ring;

and a radially resilient spring ring (4) is provided, located in the ring groove (1*a*) of the double conical ring and resiliently retained therein, the depth of the ring groove (3*a*) in the centering ring corresponding to the radial thickness of said spring ring (4) to permit receiving the spring ring (4) entirely within said groove upon assembly of said centering ring (3) over the conical surfaces.

3,972,636

HUB-TO-SHAFT COUPLING

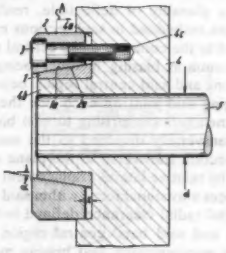
Oskar Erich Peter, Brackenheim, and Lothar Peter, Guglingen, both of Germany, assignors to Oskar Erich Peter, Brackenheim, Germany

Filed July 3, 1975, Ser. No. 592,922

Claims priority, application Germany, Aug. 29, 1974, 2441400

Int. Cl.² B60B 27/06

U.S. Cl. 403—374 **3 Claims**



1. Hub-to-shaft coupling in which the hub (4) has a central shaft bore and a ring groove (4*a*) formed in the face thereof concentric with the shaft and leaving a boss (4*b*) between the ring groove and the shaft bore in the hub;

and a clamping ring assembly comprising concentric rings (1, 2) having respective matching conical surfaces, said clamping ring assembly fitting in said ring groove (4*a*) and clamping bolts (3) extending axially into the hub to tighten said concentric conical engaging rings against each other,

characterized in that

the inner one (1) of the concentric rings has only one continuous conical outer surface (1*a*) which is stressed in compression by the conical surface of the outer ring (2*a*), the outer ring (2) having greater radial thickness than the inner one, the radial depth of the ring groove (4*a*) and its axial extent in relation to the combined radial thickness of the concentric rings and their axial extent is such, and the conical surfaces are so related and matched to each other that, in loosely assembled condition, the inner end surface of the outer ring (2) is spaced from the axially facing surface of the ring groove (4*a*) by a predetermined distance (*x*), and said axially facing surface of the ring groove (4*a*) forms a stop or abutment for both rings upon final axial tightening of the outer ring (2) over the inner ring (1) upon tensioning of said bolts (3), and assures filling the entire ring groove and provide for radial support of the hub in the region of the ring groove as well as for transfer of torque from the shaft to the hub by engagement of the boss of the hub with the shaft, and the rings with each other and with the hub, respectively, the distance (*x*) being further matched to the material strength of the bolts and of the rings to provide a predetermined clamping pressure of the rings against each other and hence of the hub and the boss on the shaft.

3,972,637

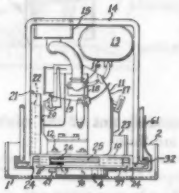
REVERSIBLE SELF-PROPELLED PLATE COMPACTOR

John W. Sutherland, P.O. Box 5050, Jacksonville, Fla. 32207

Filed July 31, 1975, Ser. No. 599,011

Int. Cl.² E01C 19/34

U.S. Cl. 404—133 **6 Claims**



1. A vibratory plate compactor comprising a horizontal work-engaging plate, an eccentric weight, vibratory base means supporting said weight for rotation on a horizontal axis, motor means carried by said base for rotating said weight, and bearing means interposed between and supporting said base means in vibration transferring relation above said horizontal plate for rotation with respect thereto about a vertical axis generally centrally of said plate.

3,972,638

SYSTEM IN WHICH A NUMBER OF STRUCTURAL MEMBERS ARE USED TO FORM COMPOUND STRUCTURES, PARTICULARLY STRUCTURES FOR FURNISHINGS

Marcello Vivoli, Florence, Italy, assignor to Arte Vetrina s.r.l., Italy

Filed Feb. 18, 1975, Ser. No. 550,714

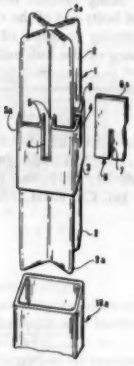
Claims priority, application Italy, Feb. 15, 1974, 3337/74

Int. Cl.² F16D 7/00

U.S. Cl. 403—174 **4 Claims**

1. In a structure of the type including tubes, rails, and means for connecting tubes and rails, the improvement which comprises: at least one of said means for connecting comprising an axially symmetric central body portion and a plurality of intersecting fins extending axially from said central body portion and having a common line of intersection coaxial with said central body portion, a lateral side of said central body portion having therethrough at least one slot extending parallel to the line of intersection of said fins to an edge defining an end of said central body portion; said rails having slotted end portions for engaging with the slot through the lateral surface of said central body portion; and said tubes having hollow end portions dimensioned to receive and grip the axially extending fins to maintain the fins engaged therewith, and having end portions with lateral surfaces complementary

to the lateral surface of said central body portion, whereby the lateral surfaces of a central body portion and a tube in which



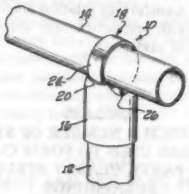
the axially extending fins of the central body portion have been inserted are flush.

3,972,639

PIPE COUPLING

George O. Lening, 1867 S. Valencia, Rowland Heights, Calif. 91745

Filed July 17, 1975, Ser. No. 596,629
Int. Cl.² F16B 7/08
U.S. Cl. 403—191 18 Claims



1. A pipe coupling for joining two pipes in transverse relation to one another, comprising

a sleeve providing a socket opening through one end of the sleeve for receiving an end of one pipe,

a ring positioned within the other end of said sleeve with the plane of the ring parallel to the longitudinal axis of the sleeve and with the outer side of the ring seating against first diametrically opposite portions of said other sleeve end, whereby a minor portion of the ring protrudes into the latter sleeve end, a major portion of the ring projects beyond the latter sleeve end, and the latter sleeve end has second diametrically opposed portions spanning the open sides of said ring between said first diametrically opposed sleeve portions, and

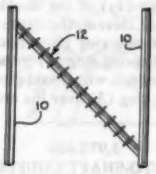
said second sleeve portions converging inwardly toward one another into overlapping seating contact with the inner side of said minor ring portion to firmly secure said ring to said sleeve with the ring exposed to receive the other pipe.

3,972,640

HIGHWAY JOINT WITH SPRING TORSION BAR

Raphael W. Miller, 1406 W. Franklin St., Jackson, Mich. 49203

Filed Sept. 16, 1974, Ser. No. 506,470
Int. Cl.² E01C 11/14
U.S. Cl. 404—62 4 Claims



1. A concrete highway joint system comprising, in combination, substantially planar adjacent concrete highway sections having abutting ends defining a joint, said ends being obliquely disposed in a horizontal direction with respect to the length of said sections, a plurality of deflectible, resilient, elongated biasing members embedded in said sections each having end regions exposed to the concrete and a central region, said end regions of a common biasing member being embedded in different sections and said central region being located adjacent and bridging said joint on each side thereof, said elongated biasing members comprising torsion bars, said end regions being transversely disposed to the associated central region in a direction transverse to the plane of said highway sections whereby relative lateral displacement of said highway sections produces a torsional force within said central regions, and a substantial radial clearance defined between said concrete sections and said bars' central region by an annular resilient jacket encompassing said biasing members' central region permitting lateral bending of said regions with respect to the length of said members and a relative internal displacement of adjacent sections, said clearance being sufficient to permit said central region bending without damaging the concrete of said sections adjacent said joint.

3,972,641

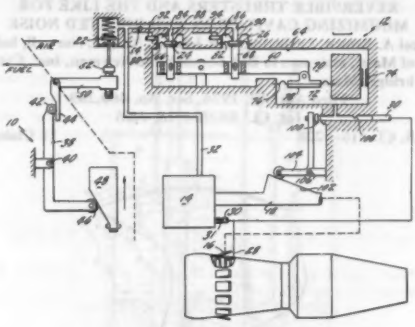
COMPRESSOR BLEED SENSOR AND CONTROL FOR TURBINE TYPE POWER PLANTS

Kermit I. Harner, Windsor; William W. Hixson, Wethersfield; Michael A. Spadafora, Windsor, all of Conn., and Charles F. Stearns, Longmeadow, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 457,955, April 4, 1974, Pat. No. 3,924,960. This application Apr. 4, 1975, Ser. No. 565,178
Int. Cl.² F01B 17/08; F02C 9/14
U.S. Cl. 415—28 4 Claims

1. In a compressor bleed system for a gas turbine power plant having a compressor where the bleed system alters the geometry of said power plant and affects the airflow in the power plant, means responsive to the pressure of the airflow of said compressor for producing a signal indicative of a rate change of said pressure, and compensating means responsive

to said geometry change of said power plant to modify said pressure responsive means to compensate for the affect of said



geometry changes affecting the pressure of said airflow so that said signal is indicative of acceleration of said power plant.

3,972,642

GAS TURBINE

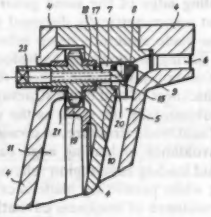
Hans Fricke, Oberstedten, and Hans Schümmer, Oberursel, both of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany

Filed Feb. 28, 1975, Ser. No. 553,883

Claims priority, application Germany, Mar. 2, 1974, 2410139

Int. Cl.² F04D 27/00

U.S. Cl. 415—145 **5 Claims**



1. A gas turbine which includes in combination: compressed air generating means, conduit means for receiving compressed air and conveying same to a combustion chamber, connecting means interposed and establishing communication between said conduit means and said compressed air generating means, compressed air withdrawing means arranged for communication with said connecting means, flow dividing means arranged in a portion of said air withdrawing means and adjustable selectively to extend into said connecting means to thereby divide the flow of compressed air passing through said connecting means into a first quantity to pass to said conduit means and a second quantity to pass into said compressed air withdrawing means while simultaneously creating a constriction in said connecting means ahead of said conduit means to prevent any material pressure drop in the air passing from said connecting means into said conduit means, said conduit means forming an annular passage, said flow dividing means including a distributing ring of an approximately triangular cross section selectively movable into said connecting means in a direction approximately transverse thereto only then when compressed air withdrawal occurs, housing means confining said compressed air withdrawing means, threaded spindle means operatively connected to take hold of said distributing ring for displacing the same, and nut means rotatably but axially non-displaceably mounted in said means and operatively in mesh with said threaded spindle means.

3,972,643

ROTARY PUMP

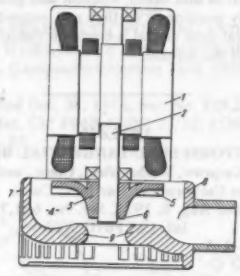
Ingemar Franzen, Pforzheim, Germany, assignor to ITT Industries, Inc., N.Y.

Filed Mar. 28, 1975, Ser. No. 563,024

Claims priority, application Sweden, Apr. 9, 1974, 7404751

Int. Cl.² F04D 27/02

U.S. Cl. 415—146 **3 Claims**



1. A rotary pump of the Vortex impeller type comprising:
a motor;
a pump housing having an inlet opening; and
an impeller coupled to said motor, said impeller having an axial extending hub, the outer part of said housing being made of a rigid material and the inner part of said housing surrounding said impeller and said inlet opening being made of a resilient material, said resilient material having a non-rigid edge which, in cooperation with said pump housing, forms said inlet opening so that a maximum volume current causes the non-rigid edge of said resilient material to fold inward toward said axial extending hub to diminishing the inlet area.

3,972,644

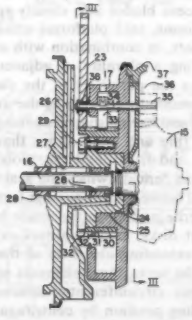
VANE CONTROL ARRANGEMENT FOR VARIABLE AREA TURBINE NOZZLE

Roger W. Johnson, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 27, 1975, Ser. No. 544,161

Int. Cl.² F01D 17/12, 17/16

U.S. Cl. 415—163 **5 Claims**



1. A turbine including a turbine housing having a turbine wheel rotatably mounted therein and inlet means for directing

gas radially inward toward said wheel, and control means comprising:

a plurality of vanes pivotally mounted in said inlet means on a common circle about the periphery of said turbine wheel for controlling the flow of gas through said inlet; and,

control means for adjusting said vanes in said inlet, said control means comprising a gear segment connected to each of said vanes and a central annular gear rotatably mounted co-axially of said turbine meshing with each of said gear segments, and a lever including a gear segment on one end thereof in meshing engagement with said central gear for moving said central gear for simultaneous adjustment of said vanes, wherein said gear segments are alternately positioned in first and second planes about said central gear and at a common radial distance from the axis of the turbine.

3,972,645

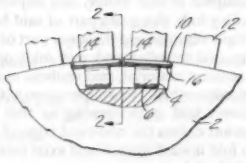
PLATFORM SEAL-TANGENTIAL BLADE

Robert Felix Kasprow, Wethersfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 4, 1975, Ser. No. 601,741

Int. Cl.² F01D 5/30

U.S. Cl. 416—215 **5 Claims**



1. A rotor construction including a disk having a blade root retaining slot extending circumferentially on the periphery of the disk, a plurality of blades mounted on the periphery of the disk, each blade having a root received in the slot, each of said blades having a platform thereon overlying the peripheral surface of the disk and an operative portion extending outward from the platform, each platform extending toward the platforms on adjacent blades into closely spaced relation to the adjacent platforms, said platforms extending axially beyond the blade roots, in combination with a seal in the form of a ring underlying a plurality of adjacent platforms and positioned between the periphery of the disk and the blade platforms and substantially as wide as the axial dimension of the platforms, said seal having spaced openings between opposite edges of the ring and each larger than the blade root therein to accept and fit around the roots adjacent to the associated platforms beneath which the seal is positioned, the material of the seal between the openings forming crossbars so spaced as to underlie and close the space between the platforms on adjacent disks, said crossbars extending between circumferentially extending elements of the seal located on opposite sides of the roots, these elements serving to hold the crossbars in proper circumferential spacing and said ring being held in sealing position by centrifugal force when the rotor is rotating and being otherwise unattached to disk or blades.

3,972,646

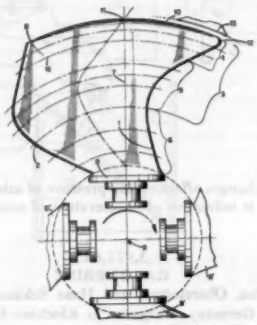
PROPELLER BLADE STRUCTURES AND METHODS PARTICULARLY ADAPTED FOR MARINE DUCTED REVERSIBLE THRUSTERS AND THE LIKE FOR MINIMIZING CAVITATION AND RELATED NOISE

Neal A. Brown, Lexington, and John A. Norton, Norwell, both of Mass., assignors to Bolt Beranek and Newman, Inc., Cambridge, Mass.

Filed Apr. 12, 1974, Ser. No. 460,289

Int. Cl.² B63H 1/18, 1/26

U.S. Cl. 416—228 **11 Claims**



1. A fully immersed propeller bade structure for providing reduced cavitation and noise in marine and related applications, said structure having a substantially circular cylindrical blunt tip edge with a surface connecting opposite faces of said blade structure, a leading edge with at least a forwardly skewed radially outer region on one side of the blade structure axis, and a trailing edge of the same general outline as the leading edge but unsymmetrically disposed on the other side of said axis, the blade structure being substantially flat and untwisted and having sections of hydrofoil shape and the minimum blade section thickness-to-chord ratio being at least about 6%, the thickness of said blade structure at said tip edge surface being substantially the same as the thickness at adjacent sections of said blade structure, to provide angle of attack tolerance for avoidance of leading edge cavitation, the forward skew of said leading edge region relieving inherent blade tip overloading while permitting blade section thickness appropriate for avoidance of thickness cavitation.

3,972,647

SCREEN FOR INTAKE OF EMERGENCY SUMP PUMP

Karl O. Niedermeyer, 17W068 North St., Bensenville, Ill. 60106

Continuation-in-part of Ser. No. 460,423, April 12, 1974, Pat. No. 3,941,507. This application Sept. 9, 1974, Ser. No. 504,426

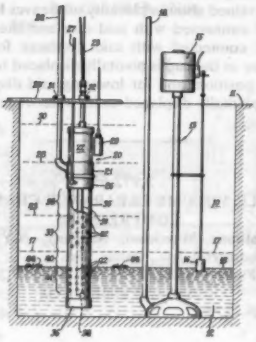
Int. Cl.² F04B 41/06, 49/04

U.S. Cl. 417—2 **8 Claims**

1. In a pump apparatus including a pump having a body, and power means for driving the pump, said pump having an intake opening and used to remove liquid from a sump, bilge, or the like wherein liquid accumulates with the liquid normally being between predetermined limits of height, and a screen device enclosing said intake opening for restricting access of floating debris to said opening, the improvement comprising:

said screen device comprising a tube having upper and lower ends, the upper end being affixed to said body with the tube extending downwardly therefrom, said tube having four portions in vertical arrangement, the uppermost of the portions being solid, the next lower portion having openings therein, the then next lower portion

being solid, and the lowermost of the four portions having openings therein,



said pump having an intake conduit extending from said body through said tube, said conduit defining said intake opening adjacent the lower end of the tube,

said body forming a closure for the upper end of the tube.

3,972,648

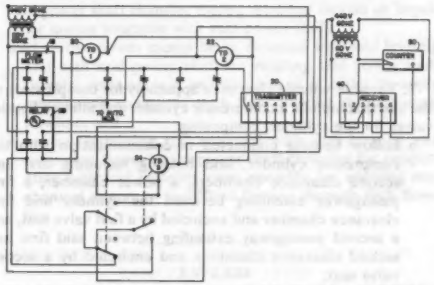
WELL CONTROLLER AND MONITOR

Paul B. Sangster, P.O. Box 158, Skellytown, Tex. 79080

Continuation of Ser. No. 427,952, Dec. 26, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 528,520

Int. Cl.² F04B *49/00*

U.S. Cl. 417—12 **2 Claims**



1. A control and monitoring system for oil and gas wells comprising:

a. pump means for producing, when in operation, an output from a well;

b. a positive displacement meter measuring the output of a well;

c. time delay device means;

d. signal source means responsive to said measured output of a well as measured by said positive displacement meter for producing a transduceable signal from said positive displacement meter for resetting said time delay device means;

e. means for energizing a relay device in response to said signal to send a reset signal to said time delay device means;

f. means to continually and repeatedly reset said time delay device means, so long as, and if and only if, said reset signal is received from said relay device in response to said signal received from the said positive displacement meter measuring the output of said well within and prior to the expiration of a predetermined time interval established within said time delay device means;

g. said time delay device means further including means switching said well to a rest cycle in which the said pump means are shut off for a predetermined period of time in the absence of receiving said reset signal within the said predetermined time interval; and

h. said time delay device means additionally including means for returning the well to an operational condition for so long as said time delay device means continues to be reset following said predetermined period of time during which the said pump means are shut off.

3,972,649

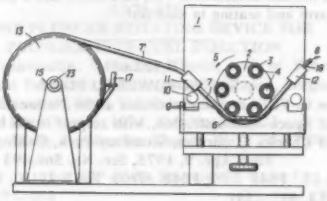
METHOD OF PERISTALTIC PUMPING AND DEVICE FOR WORKING BY SUCH METHOD

Werner Jütte, Gumpendorferstrasse 25/4, 1060 Vienna, Austria

Filed Oct. 30, 1974, Ser. No. 519,230

Int. Cl.² F04B *43/08, 43/12, 45/06*

U.S. Cl. 417—53 **13 Claims**



5. A peristaltic pump comprising:

a flexible tube,

claming elements for squeezing said tube periodically against a base surface so as to define clamping points with said base surface, the clamping points travelling in the conveying direction of the fluid to be pumped,

said flexible tube having a storage portion movably supported upon storage means for movably supplying said storage portion of said tube to said clamping points, and

means for controlling the movement of said storage means and said flexible tube at a predetermined rate.

3,972,650

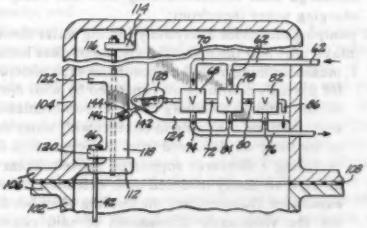
SEWAGE SYSTEM

Bernard E. Brennan, 16740 Cleveland Road, Granger, Ind. 46530

Continuation-in-part of Ser. No. 394,053, Sept. 4, 1973, abandoned. This application Nov. 1, 1974, Ser. No. 520,156

Int. Cl.² F04F *1/06*

U.S. Cl. 417—128 **1 Claim**



1. A preassembled sewage collection unit adapted for connection between a sewage source and a sewage discharge

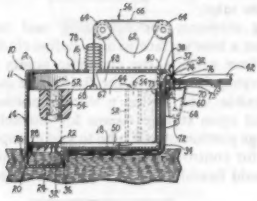
system and with a source of compressed air, comprising a container having sewage inlet and outlet openings, each associated with a check valve, an air inlet connection and an air vent, a multi-stage valve assembly mounted within the upper portion of said container and connected to said air inlet and said air vent, said valve assembly including a pilot valve connected to said air inlet and having a spring urged actuator, a first pneumatically actuated valve connected to said air inlet and responsive to actuation of said pilot valve, and a second pneumatically actuated valve responsive to actuation of said first pneumatically actuated valve for discharging compressed air into the upper portion of said container, each of said valves closing said air inlet connection and open to said vent in response to one operative position of said pilot valve, a cam shiftable in said container between two limit positions and engaged by said pilot valve actuator, a float shiftable in said container in response to the level of sewage therein, and a quick-throw mechanism in said container responsive to variation of the level of the float for shifting said cam from one limit position to the other limit position, said cam being rockable between limit positions and including an elongated arcuate slot, a spring urging said cam to limit position, an elongated arm rockable concentrically of said slot and cam and having a lost motion connection with said float, and a pin carried by said arm and seating in said slot.

3,972,651

SOLAR-POWERED PUMP

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Charles C. Kirsten, Monterey Park, Calif.

Filed Apr. 9, 1975, Ser. No. 566,493
Int. Cl.[2] F04F *1/06*; F04B *17/00*; F01B *29/10*; F25B *9/00*
U.S. Cl. 417—141 **7 Claims**



1. A cyclically operable pump adapted to employ sunlight as a source of energy and atmospheric air as a working fluid for intermittently delivering a stream of water from a source, comprising:

A. an hermetically sealed enclosure adapted to be seated in a source of water including a sump, means including a valved water intake port for intermittently delivering water from the source to said sump and a valved water discharge duct communicating with the sump for discharging water therefrom;

B. pumping means for alternately forcing water through said intake port and through said discharge duct including,

1. means defining in said enclosure an expansion chamber for partially confining air expanded by solar energy and means defining a cooling chamber communicating with said sump for confining in contact with water delivered to the sump air delivered from said expansion chamber including a displacer supported for rectilinear motion along a vertically oriented path extended between the expansion chamber and the cooling chamber for varying the volumetric dimensions of said chambers as motion is imparted to said displacer, and

2. air delivery means for delivering air from said expansion chamber to said cooling chamber;

C. a tipple cup supported adjacent to the discharge end of said discharge duct for pivotal displacement from a water-receiving position, wherein the cup is vertically oriented, to a water-discharge position, wherein the cup is horizontally oriented; and

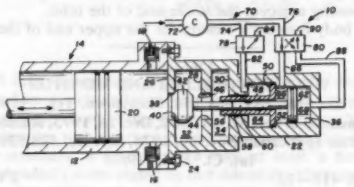
D. a line trained about a plurality of sheaves having one end thereof connected with said cup and the opposite end thereof connected with said displacer for raising said displacer as the cup is pivotally displaced to its water-discharge position, and for lowering said displacer, as said cup is pivotally displaced to its water-receiving position.

3,972,652

VARIABLE VOLUME CLEARANCE CHAMBER FOR COMPRESSORS

Michael Anthony Minnicino, Allegany, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 14, 1975, Ser. No. 577,388
Int. Cl.[2] F04B *49/00*
U.S. Cl. 417—277 **5 Claims**



1. Variable volume clearance apparatus for compressors or the like that include a compressor cylinder and inlet and outlet valves for the cylinder, comprising:

a hollow housing connected in communication with the compressor cylinder, said housing including first and second clearance chambers, a power chamber, a first passageway extending between the cylinder and first clearance chamber and encircled by a first valve seat, and a second passageway extending between said first and second clearance chambers and encircled by a second valve seat;

a valve member located in said first clearance chamber and movable therein into sealing engagement with said first or second valve seat;

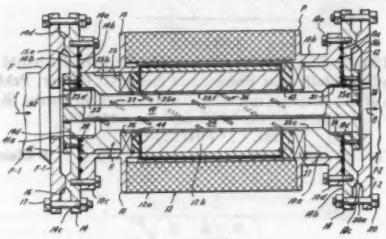
fluid pressure control means in fluid communication with said power chamber and including pressure-responsive means for selectively positioning said valve member in engagement with said first valve seat wherein neither clearance chamber is in communication with the compressor cylinder, in engagement with said second valve seat wherein said first clearance chamber is in communication with the compressor cylinder, or out of engagement with both said valve seats wherein both said clearance chambers are in communication with the compressor cylinder, said pressure-responsive means including a first pressure-responsive piston movably located in said power chamber, connection means operably joining said piston and valve member for joint movement, and a second pressure-responsive piston movably located in said power chamber and having an extended portion thereon for engaging said valve member.

3,972,653

IN-LINE PUMP DEVICE

Larry G. Travis, 2106 Rimrock, Kemah, Tex. 77565, and Paul J. Taylor, 9935 Sagerock Drive, Houston, Tex. 77034

Filed Feb. 10, 1975, Ser. No. 548,289
Int. Cl.² F04B 17/04
U.S. Cl. 417—356 6 Claims



1. A new and improved pump device for applying mechanical energy to a fluid flowing through said device, comprising:
- a housing adapted for mounted in a flowline having a fluid flowing therethrough;
- a power shaft positioned in said housing and shaft mount means mounting said power shaft for rotation therein;
- said power shaft having a chamber for receiving such flowline fluid and including impeller means for applying mechanical energy to such flowline fluid;
- motive power means mounted with said housing substantially about said power shaft for rotating said power shaft in order to apply mechanical energy to such flowline fluid;
- said power shaft chamber having mounted therein an impeller means rotatable with said power shaft;
- said motive power means being mounted with said housing and with said power shaft for rotating said power shaft thereby rotating said impeller means in order to apply mechanical energy to such fluid flowing through such flowline; and
- a central stabilizing rod mounted with said housing and extending through said power shaft chamber for cooperating with said impeller vane assembly for applying mechanical energy to such fluid flowing through such flowline.

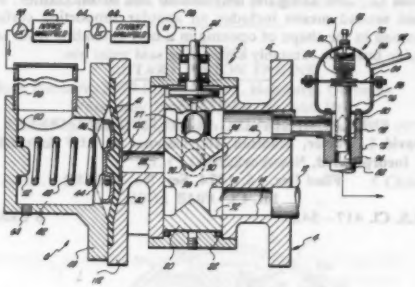
3,972,654

DIAPHRAGM PUMP BOILER FEED WATER SYSTEM

William Clayton, Pasadena, and George W. Mattox, El Monte, both of Calif., assignors to Clayton Manufacturing Company, El Monte, Calif.

Filed May 20, 1974, Ser. No. 471,242
Int. Cl.² F04B 9/08, 43/06; F22D 5/26
U.S. Cl. 417—388 28 Claims

1. A feed water supply system for supplying water from a source to a boiler and the like comprising:
- a source of hydraulic fluid;
- means for pressurizing at least a portion of the hydraulic fluid;
- a pumping apparatus driven by the hydraulic fluid and adapted to be connected to the source of water for supplying water to the boiler;
- means for distributing the hydraulic fluid to and from the pumping apparatus including an exhaust line for the hydraulic fluid;
- means for varying the rate of hydraulic fluid delivered to the pumping apparatus to control the pumping rate; and
- means for reducing any pressure surging of hydraulic fluid including means for varying the pressure of the exhaust-



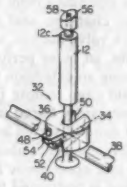
ing hydraulic fluid from the pumping apparatus in the exhaust line in response to the pressure of the feed water.

3,972,655

PUMP PLUNGER ROTATING DEVICE FOR PLUNGER-TYPE FUEL INJECTION

Manabu Tsunematsu; Nobuteru Hitomi, both of Yokosuka, and Koichi Takahashi, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 8, 1974, Ser. No. 496,021
Claims priority, application Japan, Aug. 16, 1973, 48-95641[U]
Int. Cl.² F04B 7/04, 39/10
U.S. Cl. 417—494 1 Claim



1. A fuel injection pump comprising:
- a pump plunger having an obliquely inclined top for varying the quantity of fuel delivered by rotation of said plunger about a longitudinal axis thereof;
- a control rod movable substantially perpendicularly with respect to the longitudinal axis of the pump plunger in response to the engine load;
- a cotter disposed through the pump plunger with its longitudinal axis being substantially at a right angle to the longitudinal axis of said pump plunger;
- an axial pin fixedly attached to the control rod and intersecting the control rod substantially at a right angle thereto; and
- a cylindrical guide bush including first means for movably supporting said cotter and second means for movably supporting said axial pin, whereby movement of said guide bush and said cotter and thereby rotate said pump plunger about its longitudinal axis, said plunger being enclosed in a cylinder, said inclined top surface cooperating with port means in said cylinder in order to vary the quantity of fuel delivered as a function the plunger's position about its longitudinal axis, said first means slidably supports said cotter along the longitudinal axis of the cotter, and said second means rotatably supports said axial pin, said first means includes a guide surface in the shape of a slot extending along the diametrical direction of said guide bush.

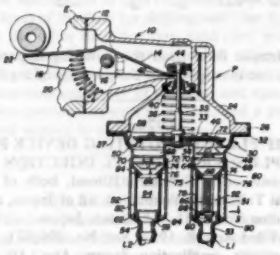
an additional slot in said guide bush extending in a direction parallel to the longitudinal axis of said plunger, said diametrical and additional slots cooperating for allowing said guide bush to move along the longitudinal axis of said cotter, and said second means includes an annular supporting surface formed in the shape of opening in a tang extending from said guide bush for rotatably supporting said axial pin.

3,972,656

FUEL PUMP HAVING PULSATING CHAMBERS

David L. Porter, Madison, Ill., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Dec. 16, 1974, Ser. No. 533,180
Int. Cl.² F04B 11/00
U.S. Cl. 417—542 3 Claims



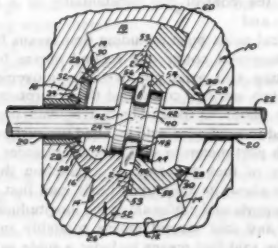
1. A diaphragm fuel pump comprising a body having an outer wall defining a pumping chamber and a generally cylindrical shaped projection extending from said wall and in fluid communication with said chamber, said projection defining a fuel cavity having a check valve therein, said projection terminating in a peripheral rim, an outer perforated cage sealed to said projection and forming an extension thereof, a fuel nipple inserted in an end of said cage remote from said projection, said nipple having an outwardly flared inner end portion, an elastomeric tubular fuel conduit sealed to and extending from said peripheral rim, said fuel conduit also being sealed to said flared end, and wherein said elastomeric fuel conduit serves as a pulsation dampener and is restrained in its outward expansion by said perforated cage.

3,972,657

SLANT AXIS ROTARY MECHANISM

John M. Clarke, Mollington, near Banbury, England, and Paul J. Staebler, Dunlap, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 12, 1975, Ser. No. 631,017
Int. Cl.² F01C 1/02
U.S. Cl. 418—53 3 Claims



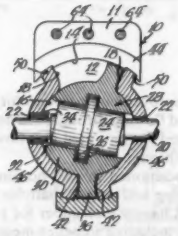
1. In a slant axis rotary mechanism, the combination of,
a housing defining an operating chamber;
a shaft journalled within said housing, said shaft including an angularly offset portion within said chamber;
said angularly offset portion including an outwardly opening peripheral groove;
a thrust collar disposed in said groove; and
a rotor journalled on said angularly offset portion, said rotor being formed of two rotor segments secured together, said rotor segments, at their interface, including complementary groove parts clampingly receiving said thrust collar.

3,972,658

HOUSING FOR SLANT AXIS ROTARY MECHANISM

Alexander Goloff, East Peoria, and Noble G. Barker, Pekin, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 12, 1975, Ser. No. 631,025
Int. Cl.² F01C 1/02
U.S. Cl. 418—53 8 Claims



1. A slant axis rotary mechanism comprising:
a housing defining an operating chamber having a radially outer spherical surface, a radially inner spherical surface and spaced opposed end surfaces extending between said spherical surfaces, said end surfaces being curved;
a shaft journalled in said housing and having an angularly offset portion within said chamber;
a rotor journalled on said angularly offset portion within said chamber, said rotor having a peripheral flange with plural apices on each side thereof, the sides of said flange being curved to match the curve of said end surfaces; and
a plurality of apex seals, one at each said apex, carried by said rotor and sealingly engaging the adjacent end surfaces.

3,972,659

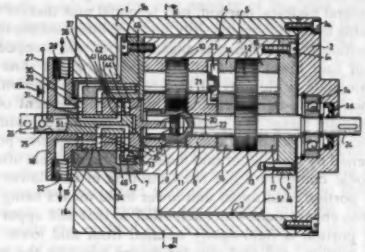
PLANETARY GEAR MOTOR HAVING FIXED AND ROTATING SUN GEARS

Paul Bosch, Ludwigsburg, and Egon Tittmann, Leonberg, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Sept. 10, 1974, Ser. No. 504,756
Claims priority, application Germany, Sept. 13, 1973, 2346104
Int. Cl.² F01C 1/08, 19/08, 21/00; F03C 3/00
U.S. Cl. 418—60 20 Claims

1. In a gear type fluid power motor, a combination comprising a housing; a rotor in said housing; an output member rotatably mounted in said housing; a plurality of groups of mating external gears in said housing, including a first group having a fixed first sun gear coaxial with said rotor and at least one first planet gear meshing with said sun gear and rotatable in said rotor whereby said rotor rotates when said planet gear rolls along said sun gear, and a second group having a rotary second sun gear coaxial with said first sun gear and arranged to transmit torque to said output member and at least one second planet gear, said second planet gear being rotatable in said rotor with said first planet gear and meshing with said

second sun gear; bearing means provided in said rotor for said gears; a supporting member rigid with said housing and rotatably supporting said rotor, said supporting member having first passages for admission of pressurized fluid and second passages for evacuation of spent fluid, said rotor having third passages communicating with said first passages and arranged to normally direct pressurized fluid against the teeth of said first and second planet gears to thereby effect a rolling move-



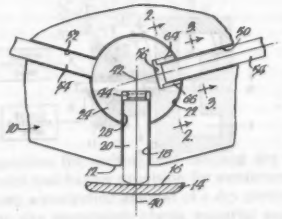
ment of said first planet gear along the associated sun gear with attendant rotation of said rotor in said housing, said rotor further having fourth passages communicating with said second passages and arranged to receive fluid which is supplied by said third passages and has passed through the tooth spaces of said first planet gear; and valve means activatable to regulate the flow of pressurized fluid in said third passages to at least one of said planet gears.

3,972,660

CORNER SEALS FOR ROTARY MECHANISMS

Ervin E. Mangus, Brimfield, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 12, 1975, Ser. No. 631,018
Int. Cl.² F01C *19/04*
U.S. Cl. 418—121 **4 Claims**



1. In a rotary mechanism having a housing defining an operating chamber and a rotor movable within the chamber, the combination of:

a piston seal receiving bore in said rotor;

a piston seal received in said bore to be carried by said rotor and sealingly engaging a wall of said operating chamber;

a first seal receiving groove in said rotor and intersecting said bore;

a correspondingly dimensioned first seal receiving groove in said piston seal and substantially centered with said first groove on said rotor;

a first seal received in said first seal receiving grooves;

a second seal receiving groove in said rotor and intersecting said bore at an angle to said first seal receiving groove in said rotor;

a second seal receiving groove in said piston seal only nominally centered with and substantially wider than said second seal receiving groove in said rotor;

a second seal received in said second seal receiving grooves; and

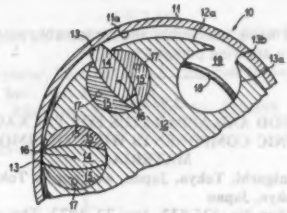
a further seal received in said second seal receiving groove in said piston seal on one side of said second seal.

3,972,661

ROTARY PISTON ENGINE

Hans Herzner, 3579 Schrecksburg, Holzburg, Germany

Filed July 29, 1975, Ser. No. 600,105
Claims priority, application Germany, July 29, 1974, 2436483
Int. Cl.² F04C *21/00*
U.S. Cl. 418—262 **5 Claims**



1. A rotary piston engine comprising a piston received within an encircling casing which has a variously configured inner surface, the piston rotatable relative to the inner surface, the piston having an outer surface which is closely spaced from the inner surface of at least one circumferential region of the inner surface, seal means carried by said piston, the seal means including a curved wall groove in the piston substantially parallel to the axis of the piston open to the outer diameter of the piston, a seal assembly within said groove, the seal assembly including a seal member projecting from the said groove into sliding engagement with the inner surface of the casing and two guide members extending parallel with the seal member, the seal member having opposed convex surfaces, the guide members having opposed concave surfaces mating with the convex surfaces, the mating surfaces being struck from a common axis, the guide members tiltable in said piston to produce opposite rocking movements to one another, the opposite movements imparting a thrust on said seal member towards and away from the casing inner surface, and means controlling tilting of the guide members.

3,972,662

MOULDING APPARATUS FOR MANUFACTURING BLADED MEMBERS FROM POWDER MATERIAL

Jack Raymond Bird, Chellaston, England, assignor to Rolls-Royce (1971) Limited, London, England

Continuation of Ser. No. 483,817, June 27, 1974, abandoned, which is a division of Ser. No. 324,185, Jan. 16, 1973, Pat. No. 3,876,742. This application Nov. 24, 1975, Ser. No. 634,743
Claims priority, application United Kingdom, Jan. 19, 1972, 2678/72
Int. Cl.² B29C *6/00*; B30B *11/02*
U.S. Cl. 425—78 **2 Claims**

1. An invertible moulding apparatus comprising:

a housing,

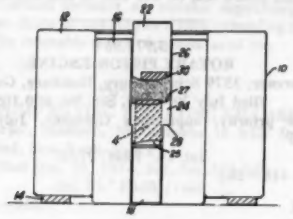
a split die contained within said housing,

a split stationary retaining means located on a shoulder of the split die,

at least one pressure applying plunger, and

a locating plunger, the split stationary retaining means being capable of holding a first part of an article within the split die with at least one end of the first part of the article extending into a space within the split die between the split retaining means and the pressure applying plunger, the locating plunger being positioned within the split die

to locate the first part of said article within the split die, the moulding apparatus being invertible and the locating



plunger being removable and replaceable with a further pressure applying plunger.

3,972,663

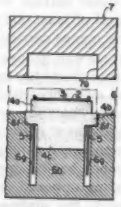
METHOD AND APPARATUS FOR PACKAGING ELECTRONIC COMPONENTS WITH THERMOSETTING MATERIAL

Kanazu Taniguchi, Tokyo, Japan, assignor to Toko Incorporated, Tokyo, Japan

Division of Ser. No. 325,833, Jan. 22, 1973. This application Mar. 13, 1974, Ser. No. 450,884

Int. Cl.² B29F *1/10*

U.S. Cl. 425—125 **2 Claims**



1. An apparatus for packaging electronic components with a thermosetting material, said electronic components each comprising a premolded base member of a thermosetting material, said base mememberbeing provided with a top portion, an intermediate flange-like portion and a bottom portion and having an electronic element embedded therein with terminal pins extending vertically through said intermediate flange-like portion and said top portion in spaced relationship with the side surfaces of said bottom portion and connected at the top portion thereof to said electronic element, said apparatus comprising upper mold means provided with at least one mold cavity portion and an inlet port communicating therewith, lower mold means below said upper mold means are provided with at least one mold cavity portion into which the electronic component is to be inserted, heater means operatively connected with said upper and lower mold means for heating said upper and lower mold means up to the softening temperatures of said thermosetting material which comprises said base member, means operatively connected to said upper and lower mold means for causing said upper and lower mold means to be moved into engagement with each other so that at least one mold cavity is defined by said at least one lower mold cavity portion and said at least one upper mold cavity portion, and injector means adjacent said upper mold means and connectible to said inlet port for injecting a molten thermosetting material into said mold cavity, said lower mold cavity portion comprising a central pedestal portion with elongated slots provided at the sides of said central pedestal portion and each capable of receiving plural terminal pins simultaneously and with stepped side portions being provided at the tops of the side walls of the elongated slots opposing the side surfaces of said central pedestal portion, the depth of said stepped side portions being slightly smaller than the thickness of said intermediate flange-like portion of said electronic component, the opening area of said upper mold cavity portion being slightly smaller than that of said lower mold cavity portion, said electronic component to be packaged being insertable into said lower mold cavity portion, said bottom portion of said base member thereof being positionable on said central pedestal portion, said terminal pins thereof being insertable in said elongated slots, and said intermediate flange-like portion thereof being engageable with said stepped portions of said lower mold so that said elongated slots each accommodate a plurality of said terminal pins therein, said pins being fluid-tightly enclosed by the engagement of said intermediate flange-like portion of said component with said stepped side portions as said intermediate flange-like portion is softened by the heat of said heater means, wherein after the electronic component has been inserted in said lower mold cavity portion, said upper and lower mold means being movable into engagement with each other so that said upper mold cavity portion is fluid-tightly isolated from said lower mold cavity portion, and said injector means injecting the molten thermosetting material into the upper mold cavity portion, whereby said electronic component is molded with said thermosetting material without having said thermosetting material adhere to the terminal pins thereof to thereby cause flashing to occur between the upper and lower mold means.

3,972,664

INJECTION MOLDING APPARATUS FOR MANUFACTURING LAYERED ARTICLES

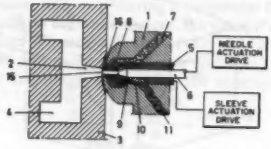
Werner Fillmann, Hilchenbach-Allenbach, Germany, assignor to Schloemann-Siemag Aktiengesellschaft, Dusselforf, Germany

Filed Aug. 19, 1974, Ser. No. 498,324

Claims priority, application Germany, Aug. 24, 1973, 2342794

Int. Cl.² B29F *1/03*; B29D *27/04*

U.S. Cl. 425—130 **1 Claim**



1. Apparatus for the fabrication of a plastic article in a closed mold, the article having a foamed core and an unfoamed outer shell, comprising:

a. an injection head having a shaped outer surface adapted to lie firmly against the injection entrance of the mold, the head having a flow passage leading to an exit passage having the general shape of a surface of revolution, the head also having a bore coaxial of but non-coextensive with the exit passage,

b. a sleeve slidably carried in the said bore and having a nose shaped to fit snugly in the said exit passage on occasion, the sleeve having a central longitudinally-extending flow passage leading to a central nozzle in the said nose, the sleeve also having a cylindrical bore coaxial of but non-coextensive with the central nozzle,

c. a needle slidably carried in the said bore in the sleeve and having a nose shaped to fit snugly in the said central nozzle in the nose of the sleeve, and in operative relationship to said injection head,

d. means for presenting plastic with no blowing agent through the flow passage of the sleeve and plastic with blowing agent through the flow passage in the head, means to actuate the apparatus to a first condition in which the needle lies axially away from the central nozzle and the sleeve lies with its nose in contact with the exit passage of the head, so that only plastic with no blowing agent flows into the mold; means for then activating the apparatus to a second condition in which the sleeve lies axially away from the exit passage of the head while the needle remains away from the central nozzle, so that both plastic with blowing agent and without blowing agent flows into the mold; means for subsequently activating the apparatus to a third condition in which the needle lies in the central nozzle while the nose remains out of contact with the exit passage, so that only plastic with blowing agent flows into the mold; and means to then activate the apparatus to a fourth condition in which the needle lies out of the central nozzle and the nose of the sleeve lies in contact with the exit passage, so that only plastic without blowing agent flows into the mold to provide the molded part with an unfoamed skin in the area of its surface adjacent the injection entrance of the mold.

3,972,665

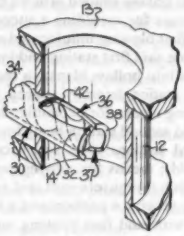
MOLDING APPARATUS WITH ADDITIVE METERING AND MIXING MEANS

Charles Lee Andrews, III, 606 Whittington Place, Statesville, N.C. 28677

Division of Ser. No. 309,950, Nov. 27, 1972, Pat. No. 3,827,678. This application May 6, 1974, Ser. No. 467,614

Int. Cl.[2] B29B *1/10*; B29F *1/12*

U.S. Cl. 425—205 **7 Claims**



1. An apparatus for melting and molding dry particulate plastic material and having provision for continuously metering and mixing a controlled amount of a dry particulate additive with the dry particulate plastic material such that the composition of the molded finished product is uniform and may be readily controlled, said apparatus comprising

a vertically directed feed throat tube defining an upper entry end and a lower discharge end,

first hopper means operatively connected to aid entry end of said feed throat tube for directing dry particulate plastic material downwardly therethrough,

a tubular member extending horizontally into said feed throat tube and defining a terminal end portion positioned within said feed throat tube and a rear end portion positioned outside said feed throat tube, said terminal end portion including an upwardly facing inlet opening and outlet opening means,

second hopper means operatively connected to said rear end portion of said tubular member for directing a dry particulate additive into said tubular member,

means including a feed auger positioned coaxially within said tubular member for conveying the additive axially therealong at a controlled rate, whereby a portion of the plastic material flowing downwardly through said feed throat tube enters said terminal end portion through said inlet opening and is mixed with the additive, and the mixed additive and plastic material in said terminal end portion is delivered into said feed throat tube through said outlet opening means,

means operatively connected to said lower discharge end of said feed throat tube for heating the mixed additive and plastic material received through said feed throat tube and conveying the heated mixture along a horizontal path of travel, and

mold means for receiving the mixed additive and plastic material from said heating and conveying means and forming the same into a molded finished product of uniform composition.

3,972,666

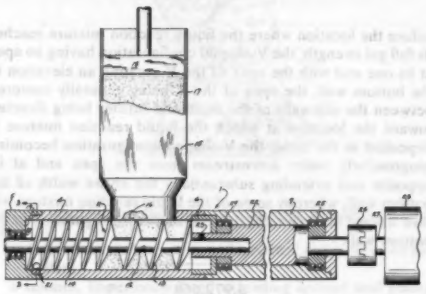
APPARATUS FOR EXTRUDING DRY POWDERED MATERIALS

Stefan S. Pandur, Port Jervis, N.Y., assignor to Kolmar Laboratories, Inc., Port Jervis, N.Y.

Filed Dec. 9, 1974, Ser. No. 530,595

Int. Cl.[2] B29F *3/06*

U.S. Cl. 425—208 **3 Claims**



1. An apparatus for extruding dry powdered materials, comprising a housing having a generally cylindrical internal chamber, an auger disposed within the chamber and having a first spiral flight section and a second spiral flight section located axially of said first section, drive means connected to said auger for rotating the auger in a direction whereby material is conveyed from said first flight section toward said second flight section, inlet feed means communicating with the chamber for delivering powdered material to the first flight section, and outlet means communicating with the chamber at the location of the second flight section, said outlet means including an outlet passage disposed generally transverse to the axis of said auger, and extending generally tangentially of said cylindrical chamber, said powdered material being conveyed by said first flight section to said second flight section and said second flight section extruding said material through said outlet passage to the exterior.

3,972,667

APPARATUS FOR CONTINUOUSLY PRODUCING FOAMED MATERIAL

Helmut G. Hanusa, Cape Girardeau, Mo., assignor to Textron, Inc., Providence, R.I.

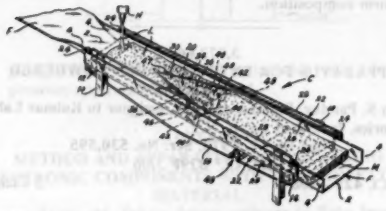
Division of Ser. No. 426,712, Dec. 13, 1973, Pat. No. 3,906,068. This application May 23, 1975, Ser. No. 580,236

Int. Cl.[2] B29D *27/04*

U.S. Cl. 425—224 **16 Claims**

1. An apparatus for producing a foamed cellular material from a liquid reaction mixture which is capable of undergoing a creaming action wherein it changes into a foam and its flow characteristics progressively diminish until the point at which

full gel strength is reached, at which point the reaction mixture becomes the foamed cellular material of generally fixed shape, said apparatus comprising: an elongated flexible sheet; means in contact with the sheet for moving the elongated sheet in the direction of its longitudinal axis; means for converting the elongated sheet as it moves into a three sided mold having upright sidewalls and a bottom wall located between the sidewalls; means for depositing the liquid reaction mixture in the mold on the bottom wall thereof; and means located beneath the mold for deforming the bottom wall of the mold into a generally V-shaped configuration beyond the location where the liquid reaction mixture is deposited on the mold and



before the location where the liquid reaction mixture reaches its full gel strength, the V-shaped configuration having an apex at its one end with the apex of the V creating an elevation in the bottom wall, the apex of the V being generally centered between the sidewalls of the mold and further being directed toward the location at which the liquid reaction mixture is deposited in the mold, the V-shaped configuration becoming progressively wider downstream from the apex and at its opposite end extending substantially the entire width of the bottom wall, whereby some of the liquid reaction mixture will flow toward the sidewalls at the V-shaped configuration in the bottom wall.

3,972,668

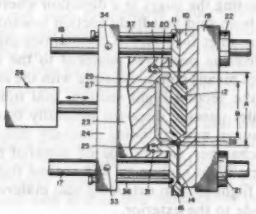
PRESSLESS INJECTION MOLDING APPARATUS

Lawrence C. Cessna, Jr., Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Feb. 19, 1975, Ser. No. 551,178

Int. Cl.² B29F *1/00*

U.S. Cl. 425—242 R **4 Claims**



1. Apparatus for injection molding comprising:

a first stationary mold plate;

a second mold plate linearly movable relative to said first mold plate, the adjacent faces of said mold plates being formed to define a mold cavity therebetween;

at least one of said mold plates having a passageway formed therein to allow injection of fluid plastic material into said mold cavity;

a backing plate mounted for limited linear movement relative to the rear face of said second mold plate;

the adjacent faces of said backing plate and second mold plate defining a false cavity therebetween, said false cavity being filled with a substantially incompressible compliant material and being in communication with said passageway;

means operatively connected to one of said mold plates for initially urging said mold plates together and for urging said backing plate toward said second mold plate; and

means in communication with said passageway for injecting fluid plastic material under pressure into said mold cavity and to exert pressure on said compliant material to generate force urging the mold plates together to counteract the forces generated within the mold cavity.

3,972,669

MULTI-STAGE BLOWMOLDING APPARATUS

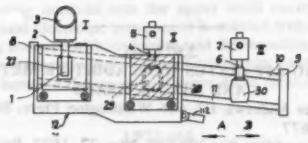
Gotfried Mehnert, Berlin, Germany, assignor to Bekum Maschinenfabriken GmbH, Berlin, Germany

Filed Mar. 21, 1974, Ser. No. 453,463

Claims priority, application Germany, Mar. 21, 1973, 7310622[U]

Int. Cl.² B29D *23/03*

U.S. Cl. 425—326 B **11 Claims**



1. Apparatus for converting plasticised parisons of synthetic plastic material into hollow shaped articles by bi-axial stretching, comprising means for extruding a succession of parisons at a first station; a first blowing unit located at a second station laterally spaced from said first station and including means for expanding parisons into hollow blanks; a second blowing unit located at a third station laterally spaced from said second station and including means for expanding hollow blanks into shaped articles, said second station being located intermediate said first and third stations; first and second multi-section open-and-shut molds; means for moving said first between a first position in which it registers with said extruding means at said first station to receive a parison and a second position in which it registers with said first blowing, unit at said second station for expansion of said parison into a hollow blank, and for moving said second mold in unison with said first mold between a third position which it assumes when said first mold is in said first position and in which said second mold registers with said first blowing unit at said second station to accept a hollow blank and a fourth position which it assumes when said first mold is in said second position and in which said second mold registers with said second blowing unit at said third station for conversion of the blank in said second mold into a shaped article; and operating means for opening and closing at least one of said molds independently of the other of said molds.

3,972,670

PRESS FOR MAKING CASTINGS OF POWDER OR GRANULAR MATERIALS

Ernst August Wilhelm Henkel, Selb, Germany, assignor to Gebruder Netzsch, Maschinenfabrik, Selb, Bayern, Germany

Filed May 20, 1975, Ser. No. 579,067

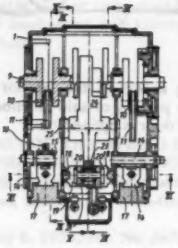
Claims priority, application Germany, May 22, 1974, 2424802; May 22, 1974, 2424803

Int. Cl.² B30B *11/02, 15/14*

U.S. Cl. 425—355 **9 Claims**

1. A press for making castings of powder or granular material comprising

a press frame,
a ram connected to said press frame,
a first press tool part including an upper die connected to said ram for movement therewith,
linkage also connected to said press frame,
a second press tool part including a mold connected for movement by said linkage,
a clamping plate,
a third press tool part including a lower die,
said upper die and said mold movable in the same direction in relation to said lower die,
a ram traverse having said ram connected thereto
a driving device including a toggle-lever drive producing a movement transmitted by said ram through said ram traverse during an adjustable phase of its approach to said clamping plate,



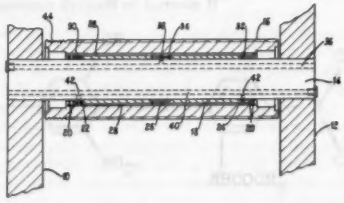
a linkage traverse firmly connected to said linkage,
a thrust piece effecting the transmission of said driving device to said linkage traverse which in order to make possible a residual stroke of said ram for the purpose of secondary compression of the pressed casting, is deflected laterally when said linkage traverse reaches a predetermined final press position,
said thrust piece being mounted on one of said two traverses,
an abutment for said thrust piece connected, adjustably in the direction of movement of said two traverses, to the other of said two traverses,
a diverter located on said press frame to divert said thrust piece from said abutment when said linkage traverse reaches a final press position.

3,972,671

ROLL ASSEMBLY FOR USE IN PROFILING FILM

Frank Metcalf Aspin, Barnacre, Bexton Lane, Knutsford, Cheshire, England

Filed May 7, 1975, Ser. No. 575,966
Claims priority, application United Kingdom, May 8, 1974, 20197/74
Int. Cl.² B29C 17/00
U.S. Cl. 425—363 4 Claims



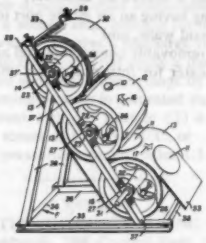
1. A roll assembly for use in the profiling of film of plastics material comprising at least one fluid inlet conduit extending within, and along the length of, the roll assembly; at least one fluid outlet conduit extending within, and along the length of, the roll assembly; a plurality of passageways disposed between the outer periphery of the roll assembly and the inlet and outlet conduits and extending along the length of the roll assembly; at least one fluid-conveying connection, in the region of each end of the roll assembly, between each passageway and a fluid outlet conduit; and at least one fluid-conveying connection, in the central region of the roll assembly, between each passageway and a fluid inlet conduit.

3,972,672

MACHINE FOR FLATTENING DOUGH BUNS AND THE LIKE

Alberto Flores Castro, Coahuila, Mexico, assignor to Thomas C. Luke, Denver, Colo.

Filed Nov. 21, 1974, Ser. No. 526,041
Int. Cl.² A23P 1/00; A47J 44/00
U.S. Cl. 425—367 6 Claims



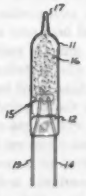
1. A machine for flattening dough buns and the like comprising:
at least two parallel pulleys and a central drum between said pulleys;
a smooth, imperforate band extending around said pulleys but behind said central drum, said drum having a laterally rounded, convex surface; and
means for rotating said pulleys and drum to cause each of said pulleys to rotate in the same direction and said drum in the opposite direction, whereby a bun of dough or the like placed on said drum will be flattened by passage between said band and said drum.

3,972,673

PHOTOFLASH LAMP

Lewis J. Schupp, Chesterland, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 23, 1974, Ser. No. 508,107
Int. Cl.² F21K 5/02
U.S. Cl. 431—95 R 17 Claims



1. Ignition primer means for a high-voltage activated flashlamp which includes, a solid mass of a mixture of powdered zirconium, a polymer binder, an oxidizer for said combustible fuel selected from an alkali metal chlorate or perchlorate

compound, and a combustion-supporting oxide-selected from CO_3O_4, $BaCrO_4$, Fe_2O_3, and the higher oxides of nickel.

3,972,674

CROP DRYING APPARATUS

Danny Hugh Harrell, 409 Dogwood Drive, Pelham, Ga. 31779

Filed July 9, 1974, Ser. No. 486,879

Int. Cl.[2] A24B *1/02*

U.S. Cl. 432—500 4 Claims

1. A barn for the storage, transportation and drying of crops comprising:

a. a running gear having a carriage, wheels for supporting said carriage, and means for propelling said carriage over the ground on said wheels; and

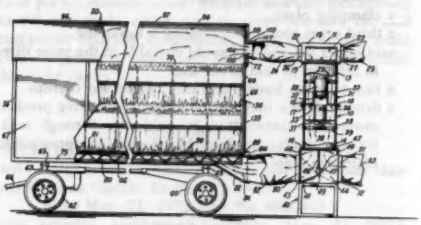
b. a housing supported on said carriage, said housing having a plurality of walls forming a bottom, a pair of upright opposed sides, an upright front, and an upright back, a roof for the sides and front and back walls; and

c. a foraminous floor above said bottom for defining, with said bottom, a heated air chamber;

d. said housing having an air intake port in the lower portion of one of said walls; and

e. means for removably connecting said air intake port to an external heater for introducing air under pressure from said heater into said chamber through said port;

one of said walls including an access door extending on opposite sides of the plane of said floor for simultaneously



permitting access to the interior of said housing and opening a portion of said chamber to the atmosphere, when said door is opened.

3,972,675

PROCESS FOR DYEING SKINS AND FURS

Max Schwank, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 298,034, Oct. 16, 1972, abandoned, which is a continuation of Ser. No. 94,544, Dec. 2, 1970, abandoned. This application July 11, 1974, Ser. No. 487,700

Claims priority, application Switzerland, Dec. 3, 1969, 18006/69

Int. Cl.² D06P *3/00*

U.S. Cl. 8—10 11 Claims

1. An exhaust process for dyeing skins and furs, comprising the step of applying to the skin or fur, in a goods-to-liquor ratio of 1:10 to 1:40, at a temperature in the range of 55° to 70°C, an aqueous dye bath having a pH of 3 to 6 which contains water, a water-soluble wool dyestuff, and 0.75 to 15 grams of a non-ionisable organic compound selected from the group consisting of isophorone and tributylphosphate, per liter of aqueous dyebath.

3,972,676

EXHAUST PROCESS FOR THE DYEING OF SYNTHETIC ORGANIC TEXTILE MATERIAL

Hans Wilhelm Liechti, Oberwil, and Raymond Defago, Reiben, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

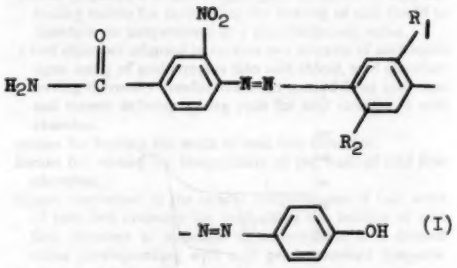
Filed May 6, 1974, Ser. No. 467,044

Claims priority, application Switzerland, May 9, 1973, 6539/73; Mar. 28, 1974, 4360/74

Int. Cl.² C09B *27/00*

U.S. Cl. 8—26 11 Claims

1. A process for dyeing synthetic organic textile material in navy blue to black shades, by the exhaust process, from halogenated hydrocarbons, which process comprises the use of at least one disazo dyestuff of formula I

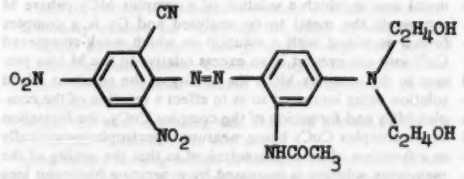


(I)

where

R_1 is hydrogen, or an alkyl or alkoxy radical having 1 to 4 carbon atoms, and

R_2 is hydrogen or an alkyl or alkoxy radical having 1 to 4 carbon atoms, or trifluoromethyl in admixture with the monoazo dyestuff of formula II



(II)

3,972,677

PROCESS FOR THE PREPARATION OF DISCHARGE EFFECTS ON DYEINGS OR PRINTS MADE WITH DISPERSE DYES ON FLAT-SURFACE TEXTILE STRUCTURES OF SYNTHETIC FIBERS

Erich Feess, Lorsbach, Taunus, and Heinz Dethloff, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 21, 1974, Ser. No. 453,530

Claims priority, application Germany, Mar. 23, 1973, 2314541

Int. Cl.² D06P *5/00*

U.S. Cl. 8—69 3 Claims

1. A process for the preparation of discharge effects on flat-surface textile structures made of synthethic fibers which comprises: applying to the textile material, as a first step, a dyeing with dischargeable disperse dyes or a mixture of dischargeable and discharge-resistant disperse dyestuffs, by padding, slop-padding or printing; thereafter, without intermediate drying or with drying at mild temperatures whereby no fixing occurs, as a second step, printing on the said dyeing a discharge paste which contains a discharge-resistant disperse dyestuff if the said dyeing did not apply a discharge-resistant dye; and as a third step fixing the dyeings by

a. either a steaming process in saturated steam followed by (1) a treatment with dry heat or (2) a treatment with superheated steam at 170 to 190°C, or

b. steaming in pressurized steam under 1.5 – 2.5 atmg.

3,972,678

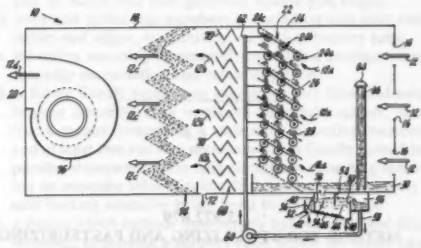
APPARATUS FOR CONTROLLING ODORS

Ghassan F. Nakshbendi, 300 Central Park Ave., Hartsdale, N.Y. 10530

Filed Aug. 30, 1974, Ser. No. 502,090

Int. Cl.² A61L *9/00, 9/01;* B01D *39/00*

U.S. Cl. 21—74 R 4 Claims



1. Apparatus for treating air comprising a first treatment chamber having air inlet means for permitting untreated air containing odoriferous substances of both small and large molecular weight to pass into said first treatment chamber, a second treatment chamber having air exit port means for permitting treated air substantially free of the odoriferous substances to be removed from said second treatment chamber, said first chamber being in air communication with said second chamber to allow air to flow from said inlet means to said exit port means, said second treatment chamber including means for providing a flow of air from said inlet means to said exit port means, said first treatment chamber including a supply of a concentrated solution of potassium permanganate to oxidize the odoriferous substances of the small molecular weight in the untreated air, spray nozzle means disposed in said first chamber for spraying a mist of said solution over the untreated air for both oxidization as well as washing of the untreated air with respect to the odoriferous substances, air

guide means disposed in said first chamber and associated with said spray nozzle means for deflecting the flow of air to maintain the untreated air under said spray nozzle means for a prolonged period of time for any given flow rate, said air guide means including a plurality of guide members vertically disposed one above another and inclined upwardly at an angle with respect to a bottom portion of said first chamber, said nozzle means including a plurality of sets of spray nozzles with each set coacting with an associated guide member, said spray nozzles of each set being disposed above its associated guide member at said angle with respect to said bottom portion to allow said untreated air to flow therebetween to provide partially treated air exiting therefrom, reservoir means disposed at said bottom portion of said first chamber below said spray nozzles for receiving said solution containing washed out odoriferous substances after spraying thereof, said reservoir means including a solution purification chamber, said purification chamber including a vertical partition spaced from a bottom wall of said purification chamber to define first and second chamber sections in communication with each other along said bottom wall, said purification chamber including means for allowing said solution to enter said first chamber section to be purified within said purification chamber and second means for allowing a purified solution to exit from said second chamber section, said first chamber section including opening means for allowing floating odoriferous substances to spill therethrough for removal from said purification chamber, said bottom wall being inclined downwardly from said first chamber section to said second chamber section, said bottom wall being provided with drain means to remove heavy odoriferous substances which sink in said concentrated solution from said purification chamber, pump means for recirculating said purified solution from said second chamber section to said spray nozzles, replenish means disposed in said reservoir means for disposing potassium permanganate crystals into said reservoir means to maintain said concentrated solution at a substantially constant level, and said second treatment chamber including adsorbing means to adsorb and remove the odoriferous substances of the large molecular weight in the partially treated air received from said first treatment chamber to provide the treated air.

3,972,679

METHOD FOR STERILIZING AND PASTEURIZING CONTAINER PACKED PRODUCTS

Kees Ruig, Amstelveen, Netherlands, assignor to Stork Amsterdam B.V., Amstelveen, Netherlands

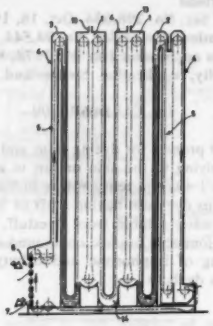
Filed Oct. 31, 1974, Ser. No. 519,699

Claims priority, application Netherlands, Nov. 12, 1973, 7315470

Int. Cl.² A61L *1/00, 3/00;* **B65B** *55/00*

U.S. Cl. 21—56 **2 Claims**

1. A process for sterilizing products packed in sealed flexible pouches comprising serially conveying a plurality of open-topped perforated receptacles, each of which contains a plurality of said pouches, through a sterilization chamber, said pouches being substantially unrestrained within said receptacles, directing streams of a heated liquid into said receptacles at a rate such that said pouches remain immersed in said liquid within said receptacles while said liquid is continuously replaced and maintaining an overpressure relative to the pressure created by the vapor of said heated liquid by introduction of a gas into said chamber, said streams of heated liquid being directed into said receptacles from nozzles positioned along substantially the entire conveyance path through said chamber, whereby said pouches attain a substantially freely floating



condition thereby permitting all of the external surfaces of each said pouch to be contacted by the heated liquid.

3,972,680

DIFFERENTIALLY KINETIC DETERMINATION OF METAL IONS

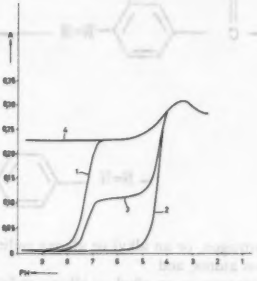
Johan George Kloosterboer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,397

Claims priority, application Netherlands, Feb. 7, 1974, 7401675

Int. Cl.² G01N *33/00, 33/16, 33/18*

U.S. Cl. 23—230 R **5 Claims**



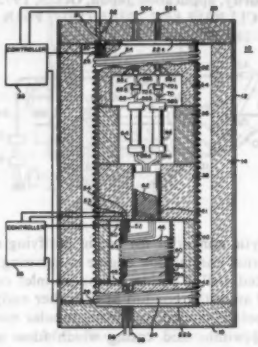
1. A method for the differential kinetic determination of metal ions in which a solution of a complex MCy, where M represents the metal to be analyzed and Cy is a complex former is mixed with a solution in which weak-complexed Cu^{2+} ions are present in an excess relative to the M ions present in the complex MCy, the acidity of the resultant mixed solution being increased so as to effect a reaction of the complex MCy and formation of the complex CuCy, the formation of the complex CuCy being measured spectrophotometrically as a function of time, characterized in that the acidity of the measuring solution is increased by generating hydrogen ions with the aid of a hydrolizable hydrogen ion generating compound dissolved in the measuring solution and that the acidity is measured as a function of time.

3,972,681

FLOW-THROUGH THERMAL DETECTOR

Peter Joseph Clack, Doylestown; Herman Wesley Levin, Philadelphia, and George Clarence Mergner, Glenside, all of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed July 14, 1975, Ser. No. 595,949
Int. Cl.² G01N 25/22, 25/48, 31/14
U.S. Cl. 23—253 R 2 Claims



1. Apparatus for measuring the concentration of a constituent of a liquid stream by measuring the heat of chemical reaction between the constituent and a reactant comprising

a heat shield having walls of thermally conductive material,

heat insulating material surrounding said walls,

means for heating the walls of said shield,

means for detecting the temperature of the walls of said shield,

means responsive to the temperature detected by said detecting means for controlling the heating of said shield to maintain its temperature at a predetermined value,

a first chamber adapted to receive two streams of said liquid upon entry of said streams into said shield, said chamber having thermally conductive walls spaced from said case and means defining a long path for said streams in said chamber,

means for heating the walls of said first chamber,

means for sensing the temperature of the walls of said first chamber,

means responsive to the sensed temperatures of said walls of said first chamber for controlling the heating of said first chamber to maintain its temperature at a desired value corresponding with said predetermined temperature of said shield,

a second chamber in said shield, said second chamber comprising thermally conductive material adapted to have passages for receiving the liquid flowing from said first chamber,

a reactor column for receiving one of said flowing liuid streams after it has passed through said second chamber and for putting that stream in contact with said reactant,

a dummy column for receiving the other of said flowing liquid streams after it has passed through said second chamber, said dummy column being of similar construction to said reactor column with the omission of said reactant,

means for heat insulating said first and second chambers and said columns from said shield,

temperature sensing means at the exit end of each of said columns for sensing the temperature of said liquid stream, and

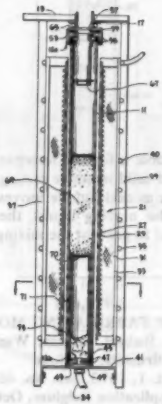
means responsive to both of the sensed temperatures for measuring the difference between the temperature of the liquid streams at the exit end of each column as an indication of the concentration of said constituent.

3,972,682

PYROLYSIS FURNACE

Thomas M. Stephens, Menlo Park, and Yoshihiro Takahashi, San Francisco, both of Calif., assignors to Envirotech Corporation, Menlo Park, Calif.

Filed Oct. 6, 1975, Ser. No. 619,768
Int. Cl.² F27B 5/14; G01N 31/12
U.S. Cl. 23—253 PC 8 Claims



1. A furnace assembly for use in a chemical analysis system utilizing high-temperature pyrolytic techniques comprising:

a. a straight refractory tube which defines a heated chamber wherein samples are pyrolyzed and which has an inlet end and an outlet end with generally square end edges;

b. inlet and outlet cap members mounted on said inlet and outlet end edges, respectively, of said refractory tube;

c. a heating assembly of generally cylindrical configuration spacedly surrounding said refractory tube;

d. a frame fixedly supporting said refractory tube and said heating assembly in a vertically-disposed position, said frame means comprising a stationary mounting member and at least two rod-like members which fixedly extend in parallel downward from said stationary mounting member on opposite sides of said cylindrical heating assembly, said heating assembly being fixed to said rods; and

e. a means which extends transversely between said rod-like members to provide a support upon which the outlet cap member rests and which presses said cap members to seal against said end edges of said refractory tube as said refractory tube expands longitudinally upon the application of heat by said heating assembly.

3,972,683

FLUID TRANSFER APPARATUS

Larry J. Lape, Sugarland, Tex., assignor to Hycel, Inc., Houston, Tex.

Filed June 7, 1974, Ser. No. 477,425
Int. Cl.² B01L 3/02
U.S. Cl. 23—259 14 Claims

1. Apparatus for aspirating a liquid sample contained in a sample container comprising:

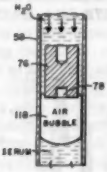
a conduit having first and second ends;

a solid member movable within said conduit towards said second end thereof;

means for moving said first end of said conduit into said sample;

said conduit being filled with a liquid prior to the time said means for moving begins to move said conduit; and

operative means coupled to said conduit for hydraulically moving liquid from said first towards said second end of said conduit between a first and a second time, said first time being prior to the time said conduit is moved into said sample and said second time being after said conduit is moved into said sample;



whereby an air bubble is formed to separate said liquid and said sample, said solid member resting upon and moving with said bubble as said bubble moves towards said second end with the moving liquid, thereby causing said bubble to expand to prevent the mixing of said liquid and sample.

3,972,684

APPARATUS FOR FABRICATING MONOCRYSTALS

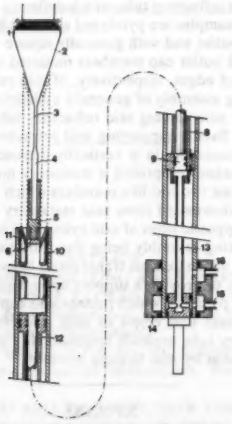
Georges Jean-Pierre Hubert Defosse, Wandre, Belgium, assignor to Elphiac, Brussels, Belgium

Filed Oct. 1, 1973, Ser. No. 402,278

Claims priority, application Belgium, Oct. 3, 1972, 4441

Int. Cl.[2] B01J *17/10*

U.S. Cl. 23—273 SP **4 Claims**



1. Apparatus for fabricating monocrystals from a monocrystalline germ held by a lower rotatable support, comprising:

a. a tube constituting said lower support,

b. a centralizing member mounted on the head of said tube and having three holes pierced therein,

c. a holder secured axially to said member for holding the monocrystalline germ,

d. an auxiliary support for holding the lower portion of the growing monocrystal, constituted of three rods, one end of each being chamfered and covered with a compressible material so as to apply a uniform pressure on the surface of the monocrystal, each of said rods running through one of said holes pierced in said member, and,

e. dilatable hydraulic means housed within said tube fixed to the auxiliary support.

3,972,685

CATALYST CONVERTER

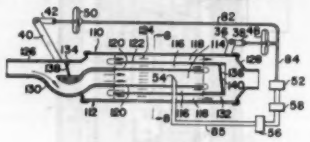
Masanori Hanaoka, 1119-63, Kamiike-cho 1-chome, Toyota, Aichi, Japan

Division of Ser. No. 448,348, March 5, 1974. This application June 9, 1975, Ser. No. 585,087

Claims priority, application Japan, Oct. 3, 1973, 48-110481

Int. Cl.[2] B01J *8/02;* **B35J** *35/04;* **F01N** *3/15*

U.S. Cl. 23—288 FC **2 Claims**



1. A catalytic converter for use in purifying exhaust gases from an internal combustion engine comprising:

an elongated walled casing having an inlet conduit at one end and an outlet conduit at the other end;

at least a pair of spaced concentric tubular members axially disposed within said casing which form a plurality of annular passages for gas flow therethrough;

a honeycomb catalyst member disposed in said annular passages;

one of said tubular members extending centrally of said casing and another of said tubular members being spaced outside of said central tubular member and spaced from the inside wall of said casing;

a bypass conduit connected to and communicating with said inlet conduit exterior of said casing at one end of said bypass conduit and connected to said central tubular member at the other end of said bypass conduit;

said other tubular member having a tubular extension disposed from its end adjacent said outlet conduit and encompassing the outlet end of said tubular members;

a first normally closed valve means disposed within said inlet conduit between its juncture with said bypass conduit and said casing;

a second normally closed valve means disposed within said extension;

temperature sensing means located within said catalyst member; and

control means operatively connected to said valve means and responsive to said temperature sensing means to simultaneously open said valve means and decrease the residence time of said gases within said catalyst as a function of said temperature.

3,972,686

DEVICE FOR LOADING CATALYST PARTICLES INTO A REACTION ZONE

James A. Johnson, Oak Lawn, Ill., and Hugh R. Wesler, Madison, Wis., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Jan. 31, 1974, Ser. No. 438,483

Int. Cl.[2] B01J *8/02;* **B65G** *65/30*

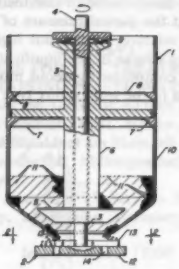
U.S. Cl. 23—288 R **4 Claims**

1. In combination with a catalytic reaction zone a catalyst particle loading device comprising:

a. a hopper having a conical bottom portion provided with an opening at its lower end, said opening communicating with said catalytic reaction zone;

b. a vertically movable hollow sleeve coaxially disposed within said hopper and having a lower conical end portion forming with said conical bottom portion of said hopper a throttle valve for said opening;

c. a rotary shaft having means for rotating said shaft connected thereto, said rotary shaft being coaxially disposed within said sleeve and extending through said opening at



the lower end of the hopper and into the upper portion of said reaction zone; and

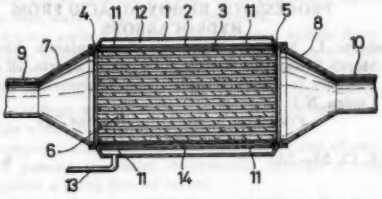
d. a particle-dispersion wheel attached to the lower end of said shaft below said opening.

3,972,687

CATALYTIC CONVERTER HAVING PRESSURIZED-GAS SUPPORT MEANS

Günther B. Frietzsche, Edenkoben, Palatinate, Germany, assignor to Paul Gillet GmbH, Edenkoben, Palatinate, Germany

Filed Mar. 21, 1974, Ser. No. 453,343
Int. Cl.² F01N 3/15, 7/00
U.S. Cl. 23—288 FC 9 Claims



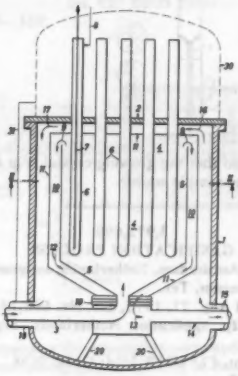
1. Exhaust system, especially for motor vehicles, comprising an exhaust pipe and an exhaust gas purifying device of the type having a monolith of ceramic material carrying a catalyst, the monolith being disposed in a metallic housing having an inlet and an outlet for exhaust gas being purified, said monolith being supported only radially in a double walled mantle having a thin inner sheet metal wall closely encompassing the monolith and an outer housing wall, said double walled mantle defining the sole support, said inner and outer walls being connected at their longitudinal ends exclusively by sealing one wall to the other and defining between them an annular space, which is filled with gas under pressure, and a conduit connecting said annular space to a source of gas under pressure.

3,972,688

REACTOR FOR CRACKING HYDROCARBONS

Gerhard Cornelius, Bergen-Enkheim; Heinz Jockel, Klein-Gerau, and Hans Kupfer, Frankfurt am Main, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jan. 28, 1975, Ser. No. 544,722
Claims priority, application Germany, Mar. 18, 1974, 2412841
Int. Cl.² B01J 8/00, 8/06; G21D 9/00
U.S. Cl. 23—288 K 7 Claims



1. Reactor for reacting gaseous or vaporized hydrocarbons with water vapor to produce carbon monoxide and hydrogen-containing gases at temperatures about 700°C and under pressures of 5–80 kg/cm² on a catalyst material contained in tubes extending into a heating zone, the reactor comprising housing means with cover plate means, said tubes extending through said cover plate means into said heating zone and being closed at the end inside the heating zone, each tube containing a concentrically disposed discharge conduit, said heating zone comprising an inner shielding wall means surrounding said tubes and having a conduit feeding gaseous heating fluid from outside the reactor into the heating zone, said inner shielding wall means being concentrically surrounded by outer shielding wall means having a top cover, said inner and said outer wall means defining a clearance space therebetween, said clearance space being open to said heating zone and having a first gas discharge conduit, said first gas discharge conduit being connected to a heat exchanger means outside the reactor, and a gas flow passage defined by said outer shielding wall means, said housing means and said cover plate means, said gas flow passage surrounding said heating zone and being connected to a cooled gas feed conduit from said heat exchanger means and a second gas discharge conduit terminating outside said reactor.

3,972,689

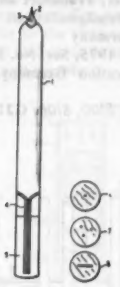
METHOD FOR VAPOR GROWING CRYSTALS

Anthony Knittel, Kensington, Australia, assignor to Unisearch Limited, Australia

Filed Nov. 25, 1974, Ser. No. 527,069
Claims priority, application Australia, Nov. 28, 1973, 5797/73
Int. Cl.² B01D 9/02; B01J 17/30
U.S. Cl. 23—294 R 6 Claims

1. A method for vapour growing crystals inside an evacuated ampoule comprising separating a liquified sample source material from the growing crystal by at least one conductance limiting and diffusion limiting channel which provides the only pathway between the sample source and the growing crystal

and which extends into the liquid sample and maintaining a temperature gradient between the sample source and the



growing crystal so that the growing crystal is at a lower temperature than the sample source.

3,972,690

GASIFICATION PROCESS

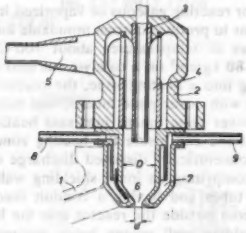
George van Os, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 27, 1975, Ser. No. 608,133

Claims priority, application Netherlands, Sept. 9, 1974, 7411916

Int. Cl.[2] C01B *2/14*; C10G *9/38*

U.S. Cl. 48—212 7 Claims



1. In the process for the partial combustion of a liquid hydrocarbon fuel containing finely dispersed solids in a substantially void reactor wherein the fuel is mixed with or finely dispersed in an oxygen-containing gas and passed as a gaseous jet through at least one supply opening in the reactor and wherein said oxygen-containing gas is introduced into said reactor with a tangential as well as axial velocity component, the improvement wherein the ratio of the axial velocity component (V_{ax}) of the oxygen-containing gas as compared to the tangential velocity component (V_{tan}) of the oxygen-containing gas exceeds 3.0.

3,972,691

METHOD FOR RECOVERING CHLORINE FROM CHLORINE-CONTAINING GASEOUS MIXTURES CONTAINING CARBON DIOXIDE AS ONE COMPONENT

Seitaro Fukushima, Omiya; Kiyoshi Kawahara, and Yukio Sugawara, both of Musashino, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Japan

Filed May 28, 1974, Ser. No. 474,147

Claims priority, application Japan, May 31, 1973, 48-61254

Int. Cl.[2] B01D *53/00*

U.S. Cl. 55—23 4 Claims

1. In a method for recovering chlorine from a chlorine-containing gaseous feed mixture, also containing another gaseous component including carbon dioxide, by means of liquification, which method comprises:

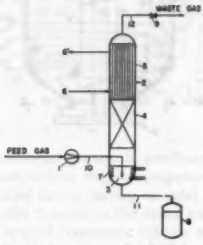
a. compressing the gaseous feed mixture; and

b. cooling the compressed gaseous feed mixture to substantially liquefy chlorine and separate same from said another gas component;

the improvement which comprises:

performing said compression of said feed mixture at a pressure such that the partial pressure of carbon dioxide in said gaseous mixture is kept not higher than 5.1 atm. absolute in the course of the liquification;

introducing the compressed gaseous mixture into a rectification column of the total reflux type comprising a con-



denser and a bottom structure, said bottom structure being adapted to receive and control the temperature of liquid chlorine, and

performing said cooling of said compressed gas mixture by means of said condenser, said condenser being regulated to a temperature above −56.6°C, to prepare and store in said bottom structure of the said column, liquid chlorine of reduced carbon dioxide content;

said gaseous feed mixture containing 20 to 90% by volume of Cl_2 and 10 to 80% by volume of CO_2, and said liquid chlorine stored in said bottom structure being subjected to temperature control within the range of 0° to 15°C to substantially release therefrom the CO_2 dissolved therein.

3,972,692

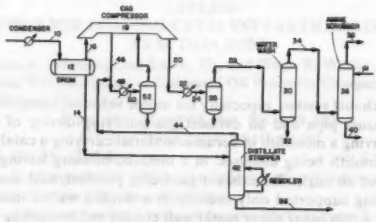
PROCESS FOR REMOVING ACID FROM HYDROCARBONS

Roberto L. Machado, Bernardsville; Benjamin Eisenberg, Morris Plains, and George P. Baumann, Sparta, all of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Apr. 3, 1975, Ser. No. 564,707

Int. Cl.[2] B01D *47/00*

U.S. Cl. 55—23 6 Claims



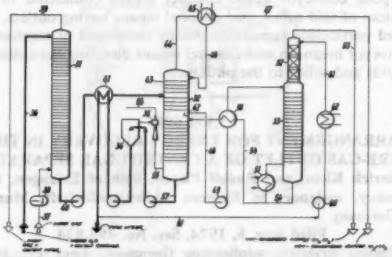
1. In a process for separating at least one hydrocarbon from other hydrocarbons in a mixture comprising light hydrocarbons and acidic gases, the improvement which comprises removing said acidic gases from said mixture prior to said hydrocarbon separation step by the steps which comprise:

a. separating said mixture into a gaseous portion and a liquid portion;
b. subjecting said gaseous portion to compression, water washing, and scrubbing with an aqueous absorbing solution; and
c. subjecting the liquid portion to stripping to remove at least a portion of the hydrogen sulfide therefrom and produce a hydrogen sulfide-containing effluent.

3,972,693
PROCESS FOR THE TREATMENT OF PHENOL-CONTAINING WASTE WATER FROM COAL DEGASSING OR GASIFICATION PROCESSES

Paul Wiesner, Oberursel; Fritz Wühler, and Hans-Martin Stönner, both of Frankfurt am Main, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 6, 1973, Ser. No. 367,387
Claims priority, application Germany, June 15, 1972, 2229213
Int. Cl.² B01D *19/00*
U.S. Cl. 55—42 **2 Claims**



1. A process for the treatment of waste water containing carbon dioxide, hydrogen sulfide and ammonia in addition to a solvent residue produced by removing a solvent from the waste water of a gasification of degasification of coal, comprising the steps of:
a. stripping the solvent residue from the waste water with a first gas to produce a waste water containing hydrogen sulfide, carbon dioxide and ammonia;
b. driving carbon dioxide and hydrogen sulfide from the waste water produced in step (a) with steam in a further gas and scrubbing said further gas with water and combining the water resulting from the scrubbing with waste water from which the carbon dioxide and hydrogen sulfide were driven;
c. removing ammonia from the combined water of step (b) by passing the latter downwardly through a column against a rising flow of steam;
d. refluxing the steam rising from said column in a concentrating zone thereabove to increase the concentration of ammonia in said zone and produce a reflux of ammoniacal water; and
e. withdrawing the ammoniacal water reflux laterally from said column below said concentrating zone.

3,972,694
FILTER TUBE

Brian Arthur Head, Chatham, England, assignor to Whatman Reeve Angel Limited, Maidstone, England

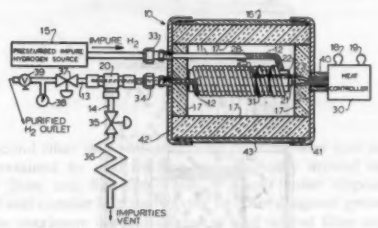
Filed Nov. 14, 1974, Ser. No. 523,587
Int. Cl.² B01D *46/00*
U.S. Cl. 55—97 **11 Claims**

10. A method of filtering a steam stream at a high temperature of up to about 168°C with reduced filter tube condensate retention, which method comprises: passing the stream of steam which is desired to be filtered at a temperature of up to about 168°C and a pressure of up to 100 psig through a filter material comprising a plurality of interrelated glass fibers, the fibers bonded at the junctions of their fiber crossovers with a hardened silicone resin bonding agent, the fibers interrelated to form a semirigid porous mass of desired filtering porosity.

3,972,695
HYDROGEN PURIFIER

Charles O. Buckley, and Julian W. Bunn, Jr., both of Raleigh, N.C., assignors to Trienco, Inc., Raleigh, N.C.

Filed May 12, 1975, Ser. No. 576,730
Int. Cl.² B01D *53/22*
U.S. Cl. 55—158 **16 Claims**



1. An apparatus for separating pure hydrogen gas from a hydrogen containing gas, comprising in combination:
a. a gas-impervious metal jacket tube having an inlet end and a vent end and having a circular cross-section and a continuous central opening capable of receiving a second tube therein, said jacket tube having the characteristics of withstanding high internal pressures and of being bendable by means of a jig, or the like, to form a helical coil, and when in a coiled condition said jacket tube substantially maintaining said continuous central opening;
b. a hydrogen permeable tube inserted within said jacket tube and residing within said jacket tube along a substantial portion of the length of said permeable tube, said permeable tube having one end thereof sealed gas tight and the other end connected to a pure hydrogen outlet, and having a circular cross-section and a continuous central opening for the passing of pure hydrogen gas therethrough, said permeable tube having an outside diameter slightly less than the diameter of said jacket tube central opening and the spacing between said permeable tube outer wall and the wall of said jacket tube central opening being such that said permeable tube may not be appreciably bent without forming a corresponding bend in the respective adjacent portion of said jacket tube, said permeable tube having the characteristic of withstanding an external pressure substantially greater than its internal pressure and having the further characteristic of being bendable by a jig, or the like, to form a helical coil without substantially altering said permeable tube continuous central opening, said jacket tube with said permeable tube inserted therein together being coiled into a helical coil having a hollow core running the length of said coil and such that the outer wall portions of said permeable tube remain in close spaced relation with the respective adjacent wall surfaces of said jacket tube central opening;
c. heater block means having associated temperature control means, said heater block means being inserted within said coil hollow core for maintaining said tubes at a controlled temperature;
d. heat insulation means for at least partially surrounding and insulating said tubes and heater block means;
e. outer container means;
f. means for introducing a hydrogen containing gas into the inlet end of said jacket tube;

g. means for venting gas impurities from the vent end of said jacket tube; and

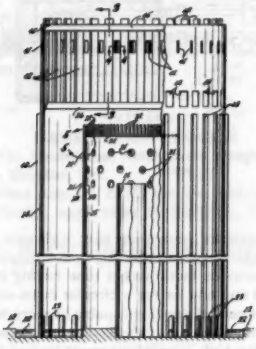
h. means for controlling the pressure in said tubes so that the pressure within said jacket tube and external of said permeable tube is greater than the pressure within said permeable tube.

3,972,696

FLUE GAS POLLUTION ELIMINATOR

Olindo R. Angelillo, 1550 Glen Aylsa Ave., Los Angeles, Calif. 90041

Filed July 24, 1975, Ser. No. 598,748
Int. Cl.² B01D *47/02*
U.S. Cl. 55—222 9 Claims



1. A device for cleaning pollutants from flue gases, said device comprising:

a first chimney for receiving said flue gases for imparting an upward velocity thereto, and for exiting said flue gases from the top of said first chimney;

a second chimney disposed surrounding said first chimney and having a height that is substantially higher than and having a diameter that is substantially bigger than said first chimney so that the gases from said first chimney discharge into said second chimney and become decelerated;

said second chimney being opened at its lower end to the atmosphere;

first means disposed for introducing a water vapor within the annular space formed between said first chimney and said second chimney at a region below the top of said first chimney so that said vapors rise with the atmospheric air to mix with the rising flue gases after the gases are discharged from said first chimney, so that selective ones of said pollutants chemically combine with the water to form an acid; and

heat exchange means for cooling the upper wall of said second chimney so that said acid may condense thereon.

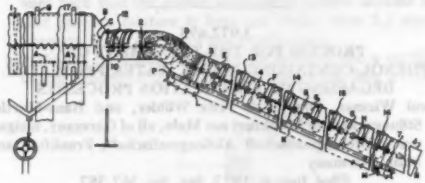
3,972,697

AIR POLLUTION CONTROL SYSTEM

Paul Frank Short, Jr., P.O. Box 3030, Hueytown, Ala. 35020

Filed May 14, 1975, Ser. No. 556,772
Int. Cl.² B01D *47/06*
U.S. Cl. 55—242 4 Claims

1. An environmental air pollution control system comprising: a conduit having an inlet aperture for collecting said emissions, a preliminary cooling means comprised of a blower fan in the conduit and multiples of air inlet holes located there-through the conduit walls, emissions conducive means comprised of dual and parallel conduction tubes connected through a common joint connection with the conduit whereby emissions may flow to each of said tubes, emissions removable means in said tubes comprises by means of sequentially spaced rotating axial fans, further emissions cooling means consisting of liquid spray means in said tubes, damper means at inlets of said tubes, emissions cooling liquid contact means comprised of a liquid spiral spray line positioned in the said



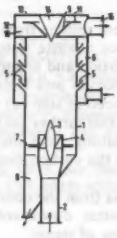
tubes adjacent to walls thereof, a horizontal desludge perforated spray pipe in said tubes adjacent to fans to direct sprays in contact with walls of said tube and fans' blades' surfaces, comprising a pollutant container means comprised of dual purpose conveyor guide channel means connected to the bottom of said tubes, said channel means having outlets, polluted particulate removable means comprised of mechanical conveyor means in said channel means directing the collected liquids and solids to the outlets.

3,972,698

ARRANGEMENT FOR ENERGY RECOVERY IN THE PURE-GAS OUTLET OF A CENTRIFUGAL SEPARATOR

Heinrich Klein, and Rudolf Pieper, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 8, 1974, Ser. No. 495,824
Claims priority, application Germany, Aug. 17, 1973, 2341789
Int. Cl.² B01D *50/00*
U.S. Cl. 55—261 7 Claims



1. In a centrifugal separator which comprises a cylindrical centrifugal chamber having a coaxial raw gas inlet at one end, said inlet having means to cause rotary motion of said gas, and a coaxial pure gas outlet at the other end and said separator is equipped with tangential auxiliary gas inlets in the wall of the centrifugal chamber between said inlet and outlet which inlets are inclined at an angle with respect to the raw gas inlet and includes a particle outlet concentrically surrounding the raw gas inlet, an improved arrangement for the recovery of energy in the pure gas outlet comprising:

a. a pure gas outlet tube, having a central axis, said outlet tube being flared out in an approximately conical manner so as to have a narrow open end and a larger open end; with its narrow end coupled to the other end of the cylindrical centrifugal chamber;

b. a cylindrical, closed chamber located at said other end of said centrifugal chamber, the larger end of said pure gas outlet tube extends into the closed cylindrical chamber,

said chamber including a cover plate spaced from said larger end of said outlet tube;

c. a radially extending plate of a diameter smaller than the chamber attached to said larger end of said outlet tube;

d. an outlet conduit for the purified gas installed in the cylindrical wall of the ring chamber at approximately the height of said radial plate; and

e. an aerodynamic body in the shape of a circular cone making a predetermined angle with its axis protruding from the cover plate into said outlet tube and having its axis coincident with said central axis.

3,972,699

FILTERING APPARATUS

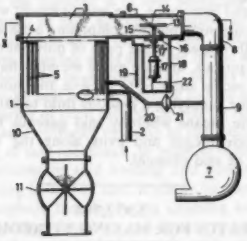
Stanislas Hage, 13, Chemin de Baudemont, B-1400 Nivelles, Belgium

Filed July 16, 1975, Ser. No. 596,537

Claims priority, application Germany, July 16, 1974, 2434097

Int. Cl.² B01D *46/04*

U.S. Cl. 55—283 **21 Claims**



1. Filtering apparatus having an inlet chamber for the materials to be filtered, an outlet chamber for said materials, filtering elements arranged between the inlet chamber and the outlet chamber, an outlet duct connected to the outlet chamber and a pump device, in which the outlet chamber is divided into at least two compartments and each compartment is provided with a flap element movable between a position for closing that passageway formed by said compartment and another position for opening said passageway, a port arranged upstream of the flap element and through which the compartment can communicate with a zone having at least an atmospheric pressure, and a valve element associated with said port to close same, said filtering apparatus further comprising a control device for said flap element and said valve element, said control device being able during the normal filtering operation, to retain said flap element in the open position thereof and said valve element in the port-closing position thereof while bringing during a filtering element cleaning operation, said flap element to the closing position thereof and said valve element to the port-opening position thereof.

3,972,700

AIR CLEANER FOR TRACTOR ENGINE

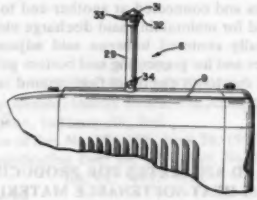
Frederick M. Gleockler, and Robert G. Gleockler, both of R.D. No. 1, Box 35, Ridgely, Md. 21660

Filed July 30, 1975, Ser. No. 600,466

Int. Cl.² B01D *27/08*

U.S. Cl. 55—385 B **4 Claims**

1. An air cleaner for an internal combustion engine comprising, an air intake conduit having an upwardly opening substantially rigid inlet end, a substantially rigid tube provided with a plurality of large openings, a collar having one end disposed around and secured to one end of said tube, the other end of said collar being secured around said inlet end of the conduit for supporting the tube in substantially an upright position thereabove, a mesh wire fabric cylinder disposed around said tube and covering the openings thereof, a porous filter paper cylinder disposed around said mesh wire fabric cylinder, means engaging around said filter paper cylinder for retaining said cylinders on the tube, means sealing the opposite upper end of said tube, said tube, the cylinders, the first mentioned means and said last mentioned means constituting a first filter unit; a bushing engaging around a portion of said first filter unit and having an outer diameter larger than the maximum diameter of said first filter unit, a second filter unit, corresponding to said first filter unit but of a larger diameter,



said second filter unit engaging over the first filter unit and being retained by said bushing concentrically around and spaced from said first filter unit; a spacer collar disposed around said conduit inlet and having an outer diameter greater than the maximum outer diameter of said second filter unit, and a pipe disposed over said second filter unit and having a lower end engaging around said spacer collar for retaining said pipe substantially concentrically around and spaced from said second filter unit, said pipe having an open upper end defining an air inlet.

3,972,701

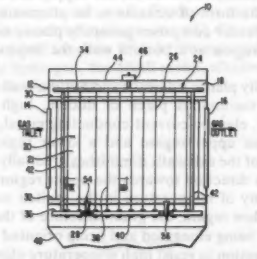
ELECTROSTATIC PRECIPITATOR HAVING ELECTRODE STABILIZER MEANS

Kalle Teel, Baltimore, Md., assignor to Environmental Elements Corporation, Baltimore, Md.

Filed Dec. 9, 1974, Ser. No. 530,618

Int. Cl.² B03C *3/00*

U.S. Cl. 55—146 **8 Claims**



1. An electrostatic precipitator for cleaning a particle laden gas passing therethrough comprising:

a shell having a gas inlet port and a gas outlet port and defining a gas chamber therein;

a plurality of laterally spaced collector electrodes suspended within said gas chamber and defining gas passages therebetween;

a discharge electrode assembly suspended within said gas chamber and electrically insulated from said shell by an insulator means connected to said shell and to said assembly, said electrode assembly including:

a. a top support grid spaced above the top of said collector electrodes;

b. a bottom guide grid spaced below the bottom of said collector electrodes;

c. a plurality of longitudinally spaced discharge electrode wires connected to said top support grid and to said bottom guide grid and extending within said gas passages; and

d. a plurality of support rods connected to said top support grid and to said bottom guide grid for supporting said bottom guide grid;

and

a plurality of electrically insulating stabilizer means connected at one end to lower portions of adjacent collector electrodes and connected at another end to said bottom guide grid for maintaining said discharge electrode wires substantially centered between said adjacent collector electrodes and for preventing said bottom guide grid from swinging due to an electrical field around said discharge electrode wires.

3,972,702

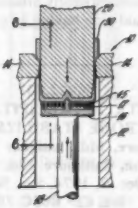
METHOD AND APPARATUS FOR PRODUCING FIBERS FROM HEAT-SOFTENABLE MATERIALS

Ronald O. McCormick, Columbus, and Robert O. Slonaker, Pataskala, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 384,163, July 30, 1973, abandoned. This application Feb. 18, 1975, Ser. No. 550,484

Int. Cl.² C03B *37/02*

U.S. Cl. 65—1 **6 Claims**



1. A resistance heated feeder for supply of molten mineral material in the form of streams to be attenuated into fibers, wherein the feeder comprises generally planar sidewalls and a stream flow region at a bottom wall, the improvement comprising:

the generally planar sidewalls and bottom wall being formed from a continuous piece of ductile, high temperature resistant, electric-current conducting metal, the sidewalls having an upper region and a lower region, at least a portion of the sidewalls diminishes gradually in wall thickness in a direction towards the upper region to provide a uniformity of temperature in the molten material at the stream flow region, the grain structure of the metal in the sidewall being elongated and being oriented in the heightwise direction to resist high temperature elongation of the sidewalls.

3,972,703

GLASS FIBER ATTENUATOR

Warren W. Drummond, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 31, 1975, Ser. No. 565,984

Int. Cl.² C03B *37/02*

U.S. Cl. 65—11 W **6 Claims**

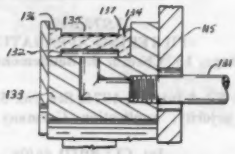
1. In an apparatus for producing glass fiber strands which includes:

a fiber forming bushing containing molten glass and having a plurality of orifices through which said molten glass flows in streams, said streams being attenuated into fibers;

means for gathering said fibers into strand;

a pair of endless flexible belts having surface portions which engage one another and between which said strand is fed to be engaged by said engaging portion;

means to rapidly move said flexible belts along a predetermined path so as to move said engaged strands along the same path and to apply attenuation forces to said fibers; and



means to release said strand from said flexible belts to disengage said strand from said flexible belts and project said strand into space, the improvement which comprises a belt tensioning means comprising a plate member movable with respect to the path of movement of one of the belts, a porous, arcuate guide member having a channel-shaped recess adapted to recieve and guide said belt and means for supplying a gaseous fluid to said porous, arcuate guide means whereby said gaseous fluid permeates said guide means and exits along the belt supporting surface of said channel.

3,972,704

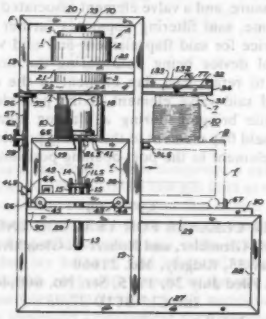
APPARATUS FOR MAKING VITREOUS SILICA RECEPTACLES

Ted A. Loxley, Mentor; Walter G. Barber, North Perry; Walter W. Combs, Mentor, and John M. Webb, Chagrin Falls, all of Ohio, assignors to Sherwood Refractories, Inc., East Cleveland, Ohio

Continuation-in-part of Ser. No. 363,622, May 24, 1973, Pat. No. 3,837,825, which is a continuation-in-part of Ser. No. 135,140, April 19, 1971, abandoned. This application Aug. 5, 1974, Ser. No. 495,129

Int. Cl.² C03B *29/00*

U.S. Cl. 65—157 **8 Claims**



7. Apparatus for mass production sintering of precision transparent cup-shaped vitreous silica receptacles comprising an induction furnace having refractory walls enclosing a heating chamber, an opening of the bottom of said chamber, and cover means for closing said bottom opening to exclude air from said heating chamber, induction heating means surrounding said heating chamber for heating each silica recepta-

cle placed in said chamber to a sintering temperature of from about 2950° to 3150°F., a graphite susceptor comprising a hollow mandrel having an external surface of a predetermined generally symmetrical shape complementary to the inner surface of the cap-shaped silica receptacle to fit and support the inner surface of the receptacle in an upside-down position, a movable carriage, means for guiding said carriage between a loading position spaced from the furnace and an operating position below the bottom opening of said furnace, means for moving the carriage from said loading position to said operating position before the end of each cycle, a cooling unit having refractory walls defining a cooling chamber which receives said graphite susceptor, cooling means surrounding said cooling chamber for receiving a circulating cooling fluid to effect cooling of each sintered silica receptacle to a temperature of from about 2500° to about 2700°F. during each cycle within one minute after completion of the sintering operation in said furnace, said cooling unit having an entrance opening to permit movement of the graphite susceptor from said furnace into said cooling chamber, motor means for causing movement of said graphite susceptor relative to said furnace and said cooling unit, said motor means causing relative vertical movement of said graphite susceptor relative to said furnace to move the susceptor through said bottom opening into said heating chamber when the carriage is in said operating position and causing movement of said susceptor relative to said cooling unit to move said susceptor through said entrance opening into said cooling chamber after sintering of the silica receptacle in said furnace has been completed, means for restricting flow of air through said bottom opening to said heating chamber during sintering of each receptacle and for restricting flow of air through said entrance opening to said cooling chamber during cooling of said receptacle to assist in maintaining non-oxidizing conditions in said heating and cooling chambers, means for feeding helium to said heating chamber to maintain a helium atmosphere therein during sintering and to remove air from said heating chamber, and electric control means to control said motor means during each cycle and to provide each silica receptacle with a predetermined cooling period in said cooling chamber, said control means including timer means for determining said sintering period, and means responsive to said timer means for causing said motor means to effect relative vertical movement between said graphite susceptor and said furnace to remove said susceptor from said heating chamber within about 1 to about 6 minutes after the susceptor is placed in said heating chamber.

3,972,705

AMIDOTHIONOPHOSPHONIC ACID ESTER CONTAINING PLANT GROWTH REGULANTS

Klaus Lürssen, Gross-Koenigsdorf, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

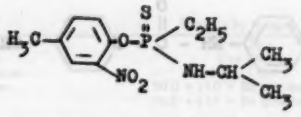
Filed Dec. 23, 1974, Ser. No. 535,901

Claims priority, application Germany, Jan. 16, 1974, 2401881

Int. Cl.² A01N 9/36

U.S. Cl. 71—78 **1 Claim**

1. Method of suppressing the growth of side shoots in tobacco plants which method comprises applying to the tobacco plants or their habitat an effective amount of O-(2-nitro-4-methylphenyl)-N-isopropylethane-thionophosphonamide of the formula



(1).

3,972,706

HERBICIDAL METHOD

Wendell Ray Arnold, Delray Beach, Fla., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 374,598, June 28, 1973, abandoned. This application Dec. 18, 1974, Ser. No. 533,897

Int. Cl.² A01N 9/12

U.S. Cl. 71—90 **4 Claims**

1. A method for killing and preventing the growth of unwanted vegetation on fallow wheatland between the time of harvesting the wheat crop and the time of the next planting of winter wheat which method comprises applying to the locus to be treated an herbicidally-effective amount of a compound of the formula:

(I)

wherein

R is C_1-C_7 alkyl,

or halogenated C_1-C_7 alkyl, each halogen being independently selected from the group consisting of fluorine, chlorine, and bromine,

R^4 is hydrogen or C_1-C_7 alkyl;

R^5 is hydrogen, C_1-C_7 alkyl, C_2-C_7 alkenyl, or C_3-C_7 cycloalkyl; and

R^6 is hydrogen, C_2-C_7 alkenyl, C_3-C_7 cycloalkyl, C_1-C_4 alkoxy, or a substituted or unsubstituted C_1-C_7 alkyl, the substituents being selected from the group consisting of halo, hydroxy, cyano, or C_1-C_4 alkoxy, except that R^5 and R^6 cannot both be hydrogen or a C_3-C_7 cycloalkyl; and,

tautomers of (I) wherein R^4 is hydrogen; and

when R^4 is hydrogen, the alkali metal, alkaline earth metal, and ammonium salts thereof.

3,972,707

N-(PHENYLCARBAMOYL)-4-METHYLPIPERIDINE HERBICIDES COMPOSITIONS AND HERBICIDAL METHOD

Frank Muller, Siegertsbrunn; Norman Hiberle, and Peter Kinzel, both of Munich, all of Germany, assignors to Consortium fur Elektrochemische Industrie GmbH, Munich, Germany

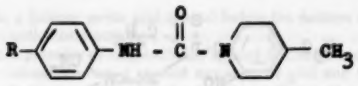
Filed Mar. 27, 1975, Ser. No. 562,476

Claims priority, application Germany, Apr. 3, 1974, 2416139

Int. Cl.² A01N 9/22

U.S. Cl. 71—94 **9 Claims**

1. An N-phenylcarbamoyl-4-methylpiperidine herbicide having the formula



wherein R is a member selected from the group consisting of hydrogen and fluorine.

3,972,708

PROCESS FOR AVOIDING FORMATION OF SMOKE AND FLAMES IN BOTTOM BLOWN CONVERTERS

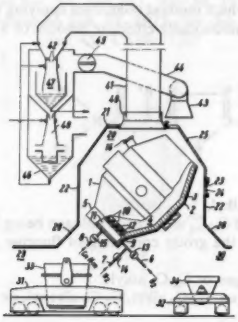
Kurt Baum, Essen, Germany, assignor to Verfahrenstechnik Dr.-Ing. Kurt Baum, Essen, Germany

Filed Sept. 11, 1974, Ser. No. 505,020

Claims priority, application Germany, Sept. 13, 1973, 2346087

Int. Cl.² C21C 5/34

U.S. Cl. 75—60 **3 Claims**



1. In a pig iron refining process carried out in a converter having bottom tuyeres, the converter being pivotable between a tipped position and an erect position; a method for avoiding formation of smoke and flames; the method comprising steps as follows:

a. automatically blowing inert gas through the tuyeres into the converter while pivoting the converter from the erect position to the tipped position;

b. continuing the blowing of inert gas while introducing scrap and pig iron into the converter;

c. automatically switching to blowing of oxygen and hydrocarbon gas and regulating substantially stoichiometric proportions while pivoting the converter to the erect position;

d. automatically switching to blowing of inert gas while pivoting the converter to the tipped position and further blowing thereof during the introduction of scrap and molten pig iron and pivoting the converter to the erect position;

e. automatically switching the blowing of oxygen and hydrocarbon gas as soon as the erect position is reached;

f. repeating switching to blowing of inert gas after finishing the blowing of step (e) and pivoting the converter into a position suitable for deslaging and pouring of steel;

g. controlling the blowing the steps (a), (b), (c), (d), (e) and (f) by the pivoting of the converter.

3,972,709

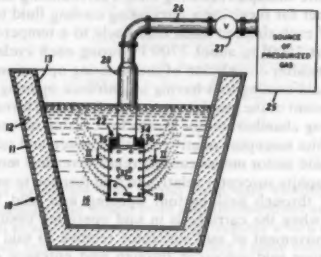
METHOD FOR DISPERSING GAS INTO A MOLTEN METAL

Enrique C. Chia, Carrollton, Ga., and Helge Ole Forberg, Owensboro, Ky., assignors to Southwire Company, Carrollton, Ga.

Continuation-in-part of Ser. No. 367,085, June 4, 1973, abandoned. This application Apr. 23, 1975, Ser. No. 570,673

Int. Cl.² C22B 9/00

U.S. Cl. 75—93 R **7 Claims**



1. A method of fluxing molten metal to remove dissolved gases and non-metallic impurities therefrom comprising the steps of:

a. providing a fluxing gas which at least partially includes a component that is non-reactive with the molten metal;

b. supplying the gas to a rotatably mounted distributor located at a submerged zone beneath the surface of the molten metal at a positive pressure sufficient to prevent physical contact between the gas and the molten metal upstream of the distributor;

c. emitting the gas from the distributor into the molten metal in a plurality of very small bubble jets extending in a direction oblique to radial lines extending perpendicular to the axis of rotation of the distributor, said jets having a tangential component which exerts a reaction force on the distributor; and

d. rotating the distributor solely in response to said reaction force in a direction opposite to the direction of said bubble jets emitted therefrom, thereby substantially preventing bubble coalescence in the region of the distributor and thus effecting uniform and complete dispersion of the bubbles through the molten metal.

3,972,710

METHOD OF UPGRADING TANTALUM AND NIOBIUM CONCENTRATION IN SLAGS

Horst Meyer, Karsten-Balder-Stieg, Germany, assignor to Hermann C. Starchk Berlin, Berlin, Germany

Filed July 9, 1975, Ser. No. 594,202

Claims priority, application Germany, July 23, 1974, 2435427

Int. Cl.² C22B 34/24

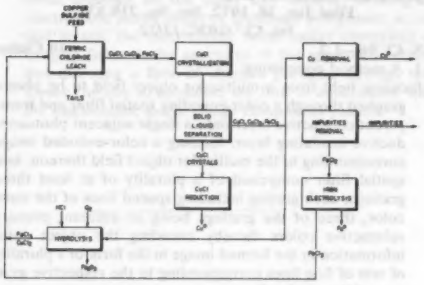
U.S. Cl. 75—101 R **4 Claims**

1. In the method of obtaining tantalum and niobium from raw materials containing them by treating the materials with a hydrofluoric acid solution optionally containing sulfuric acid to dissolve the tantalum and niobium therein and extracting the resulting acid solution with a ketone to form a ketone solution of tantalum and niobium and a spent hydrofluoric acid, the improvement comprising first pretreating the tantalum-niobium containing material with spent hydrofluoric solution from the extraction step or a silicofluoric acid solution to convert acid soluble impurities to acid insoluble fluorides without substantially dissolving tantalum or niobium.

3,972,711
CUPROUS CHLORIDE RECOVERY PROCESS

Duane N. Goens, and Paul R. Kruesi, both of Golden, Colo., assignors to Cyprus Metallurgical Processes Corporation, Los Angeles, Calif.

Filed Mar. 3, 1975, Ser. No. 554,685
Int. Cl.² C22B *15/12*
U.S. Cl. 75—117 **12 Claims**

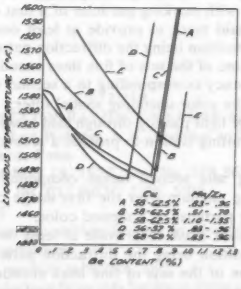


1. In a process for separating cuprous chloride from a solution comprising cuprous chloride and at least one metal chloride compatible with the solubility of cuprous chloride selected from the group consisting of ferrous chloride, sodium chloride, cupric chloride, the remaining alkali metal chlorides and the alkaline earth metal chlorides and the non-metal chloride hydrochloric acid, wherein a substantial portion of the cuprous chloride is crystallized from the solution, the improvement comprising performing the crystallization in the presence of cupric chloride in an amount such that the cupric chloride to compatible metal chloride mole ratio is at least about 0.1.

3,972,712
COPPER BASE ALLOYS

Patrick D. Renschen, Mentor, Ohio, assignor to Brush Wellman, Inc., Cleveland, Ohio

Continuation of Ser. No. 474,318, May 29, 1974, abandoned. This application Feb. 27, 1975, Ser. No. 553,485
Int. Cl.² C22C *9/04*
U.S. Cl. 75—157.5 **14 Claims**



1. A heat-treated copper-base alloy article consisting essentially of the following constituents in the proportions and ratios specified:

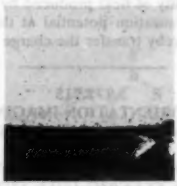
	Percent by weight
Manganese	12 to 36
Zinc	4 to 28
Beryllium	0.10 to 1.00
Copper	50.0 + (10 × Be content) 58.0 + (14 × Be content),

and such that the manganese-to-zinc ratio is between 0.4 and 10, said alloy article having excellent founding characteristics, ability to replicate mold surfaces with great detail, and improved mechanical properties.

3,972,713
SULFIDATION RESISTANT NICKEL-IRON BASE ALLOY

Donald R. Muzyka, and Clyde Raymond Whitney, both of Reading, Pa., assignors to Carpenter Technology Corporation, Reading, Pa.

Continuation-in-part of Ser. No. 474,418, May 30, 1974, abandoned, which is a continuation-in-part of Ser. No. 381,761, July 23, 1973, abandoned. This application Sept. 30, 1974, Ser. No. 510,621
Int. Cl.² C22C *19/05*
U.S. Cl. 75—171 **18 Claims**



1. A nickel-iron base alloy which is resistant to sulfidation at elevated temperatures in the range of about 1300° to 1500°F and which has good hot strength and stress rupture life at elevated temperatures up to about 1500°F when heat treated, which consists essentially by weight of about

	Percent
Carbon	0.02–0.08
Manganese	2 Max.
Silicon	0.25 Max.
Phosphorus	0.03 Max.
Sulfur	0.03 Max.
Chromium	21–24.5
Nickel	52–58
Molybdenum	1–3.5
Titanium	1.75–3.25
Aluminum	0.75–2.25
Columbium	0.50–2
Boron	up to 0.02

and the balance being essentially iron and incidental impurities.

3,972,714
METHOD FOR ELECTROSTATIC REPRODUCTION BY CHARGE TRANSFER

Guy Weber, Arques La Bataille, and Quang Pham Kim, Dieppe, both of France, assignors to La Cellophane, Paris, France

Filed Mar. 2, 1973, Ser. No. 337,744
Claims priority, application France, Mar. 3, 1972, 72.07402; Nov. 27, 1972, 72.42003
Int. Cl.² G03G *13/22*
U.S. Cl. 96—1 TE **3 Claims**

1. A method for electrostatic reproduction of an original image on an initially uncharged insulating surface comprising the steps of:

forming a preliminary charge image having a predetermined field intensity corresponding to an original image, said preliminary charge image being formed on an intermediate photoconductive surface;

advancing the intermediate photoconductive surface, at a predetermined speed, with the charge image thereon toward a point of virtual contact with the insulating surface, while advancing the insulating uncharged surface, at a predetermined speed;

transferring the charge image progressively, line by line and instantaneously from the photoconductive surface to the insulating surface to charge the insulating surface in a pattern in correspondence with said image;

advancing said photoconductive surface away from said insulating surface after transferring said image; and

developing the transferred charge image;

wherein said transferring step includes the steps of:

producing an external electric field between a pair of electrodes, at the virtual contact point, to ionize the air in the space therebetween; and

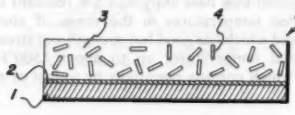
varying the electric field periodically and symmetrically, with a low frequency alternating current, wherein the frequency is coordinated with the speed of advance of the photoconductive and insulating surfaces, so that the intensity of the field produced by the alternating current, plus the intensity of field produced by the charge image exceeds the ionization potential at the point of virtual contact to thereby transfer the charge image.

3,972,715

PARTICLE ORIENTATION IMAGING SYSTEM

Koji Okumura, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 29, 1973, Ser. No. 411,595
Int. Cl.² G03G *13/12*, *13/22*
U.S. Cl. 96—1 R **10 Claims**



1. An imaging method comprising:

a. providing an imaging member comprising a layer of substantially electrically insulating softenable material having randomly oriented non-spherical electrically photosensitive particles suspended therein, said layer having a thickness above about 0.5 micron and said softenable material capable of having its resistance to orientation of particles in said softenable material reduced;

b. applying a uniform d.c. electric field across said imaging member;

c. imagewise exposing said imaging member to electromagnetic radiation; and

d. developing said imaging member by decreasing the resistance to reorientation of said elecrically photosensitive particles by softening said softenable layer at least sufficiently to allow imagewise reorientation of said electrically photosensitive particles, whereby there is substantially no particle migration in depth.

8. A method of erasing an imaged orientation imaging member comprising the steps of:

a. providing an imaged orientation imaging member comprising a layer of electrically insulating softenable material containing non-spherical electrically photosensitive particles aligned in the imagewise exposed areas and randomly oriented in the non-imagewise exposed areas, said layer having a thickness above about 0.5 micron; and

b. applying a a.c. voltage to the surface of said member while simultaneously decreasing the resistance to electrically photosensitive particle reorientation by softening said softenable layer at least sufficiently to allow reorientation of said electrically photosensitive particles.

3,972,716

COLOR ELECTROPHOTOGRAPHY USING ENCODED MULTICOLOR INFORMATION

Gerald L. Pressman, Cupertino, Calif., assignor to Electroprint, Inc., Cupertino, Calif.

Filed Jan. 24, 1972, Ser. No. 219,935
Int. Cl.² G03G *13/22*
U.S. Cl. 96—1.2 **10 Claims**

1. A method comprising:

focusing light from a multicolor object field to be photographed through a color-encoding spatial filter and transparent conductive layer onto a single adjacent photoconductive insulating layer, forming a color-encoded image corresponding to the multicolor object field thereon, said spatial filter comprised of a plurality of at least three gratings, each grating including spaced lines of the same color, three of the gratings being of different primary subtractive colors thereby encoding the object color information in the formed image in the form of a plurality of sets of fine lines corresponding to the respective gratings of the spatial filter;

positioning a single film of transparent dielectric material adjacent the surface of the photoconductive layer opposite the transparent conductive layer;

pressure biasing the film against the photoconductive surface by means of a conductive pressure plate; voltage 511. charged

applying a voltage pulse between the transparent conductive layer and the conductive pressure plate during the aforesaid step of focusing light from the multicolor object field onto the photoconductive layer thereby forming a color-encoded electrostatic latent image corresponding to the multicolor object field on the film;

developing said electrostatic latent image to form a black and white transparency having the object multicolor information encoded therein in the form of a plurality of sets of fine lines;

illuminating said transparency with coherent light;

focusing the light passing through said transparency onto a mask positioned in the Fourier transform plane of the light passing through the transparency, said mask having at least one aperture disposed in the position of the diffraction pattern formed by a first one of the sets of fine lines encoded in the image transparency, corresponding to a first one of the gratings of the color-encoding spatial filter;

imaging the light passing through said mask at an electrostatic printing station to provide a first image component;

developing said first image component on a print receiving medium with marking particles of a first color;

changing said mask to provide at least one aperture at a second position being the diffraction pattern formed by a second one of the sets of fine lines encoded in the image transparency corresponding to a second one of the gratings of the color-encoding spatial filter;

imaging the light passing through said mask at said electrostatic printing station to provide a second image component;

developing said second image component on said print receiving medium over the first image component with marking particles of a second color;

changing said mask to provide at least one aperture at a third position being the diffraction pattern formed by a third one of the sets of fine lines encoded in the image transparency corresponding to a third one of the gratings of the color-encoding spatial filter;

imaging the light passing through said mask at said electrostatic printing station to provide a third image component;

and developing said third image component on said print receiving medium over the first and second image components with marking particles of a third color;

wherein the steps of imaging at an electrostatic printing station comprise imaging the light passing through said mask onto a multi-layered apertured screen comprising at least a photoconductive insulating layer and a conductive layer, said apertured screen positioned at a printing station having a source of charged particles disposed on one side thereof and a print-receiving medium and back electrode disposed on the other side thereof, forming an electrostatic latent image of the image component across said screen, the electrostatic latent image comprised of fringing fields in the apertures of the apertured screen, and directing a flow of charged particles through said screen thereby to modulate the flow in accordance with the electrostatic latent image component pattern.

3,972,717

ELECTROPHOTOGRAPHIC RECORDING MATERIAL

Wolfgang Wiedemann, Geisenheim-Johannisberg, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Mar. 20, 1974, Ser. No. 453,170

Claims priority, application Germany, Mar. 21, 1973, 2314051

Int. Cl.² G03G 5/04

U.S. Cl. 96—1.5 **39 Claims**

1. Electrophotographic recording material comprising a conductive support, an organic photoconductive substance capable of transporting electrical charge selected from the group consisting of p- and n-conducting compounds, and a dyestuff of purple to violet color, having:

a. an X value in the range of from 0.13 to 0.52 and a Y value within the range of from 0.019 to 0.33 in the CIE system,

b. an extended π-electron system of at least 20 π-electrons, and

c. possessing a reflectance of not more than 50% throughout the spectral region of 420 to 750 nm when in the form of a single color-masking layer of about 0.1 g/m², and which has a high photosensitivity throughout the said spectral range.

3,972,718

ELECTROSTATOGRAPHIC GRAVURE MEMBER

John W. Weigl, West Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 19, 1975, Ser. No. 578,569

Int. Cl.² G03G 5/06, 5/08

U.S. Cl. 96—1.5 **14 Claims**

1. A photosensitive device for use in electrostatographic imaging which comprises:

a. an endless, arcuate substrate; and

b. a thin, conductive filament, having a layer on its surface of a photoconductive insulating material, wrapped in helical configuration around said substrate wherein the filament is connected to ground or to a suitable bias source.

3,972,719

PHOTOGRAPHIC DEVELOPER COMPOSITIONS

Gerard Laurens Vanreusel, Hove, and Raoul Jan Bortels, Wilrijk, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Continuation-in-part of Ser. No. 426,134, Dec. 19, 1973, abandoned, which is a continuation of Ser. No. 226,232, Feb. 14, 1972, abandoned. This application July 14, 1975, Ser. No. 595,442

Claims priority, application United Kingdom, Feb. 15, 1971, 4646/71; Jan. 11, 1972, 1282/72

Int. Cl.² G03C 5/30

U.S. Cl. 96—66.3 **15 Claims**

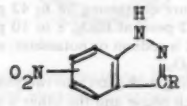
1. An alkaline aqueous developer composition suited for producing halftone images showing the lith-gradation by development of silver halide recording materials in which the halide consists of at least about 50 mole % of chloride wherein said composition comprises:

1. a p-dihydroxybenzene developing agent in an amount of about 0.05–0.50 mole per litre,

2. a sulfite compound providing an amount of sulfite ions (SO_3^{--}) of at least about 5 grams per litre,

3. a sufficient amount of an alkaline compound to impart to said composition a pH of about 9.7–11.5,

4. a nitro-indazole corresponding to the following general formula:



wherein:

R is hydrogen or a lower (C_1–C_8) alkyl group, and the nitro-group is in the 5- or 6-position,

5. a polymer containing a plurality of alkylene oxide units and having a molecular weight of at least about 1500, said polymer being present in a concentration of at least 500 mg per litre,

6. bromide ions in a concentration of at least 0.2 g per litre, said composition containing not more than about 0.05 g/l of any auxiliary developing agent that shows a superadditive developing effect with said p-dihydroxybenzene developing agent.

3,972,720

PHASE SEPARATABLE BOROSILICATE GLASS COMPOSITIONS

Joseph J. Hammel, and Ties Allersma, both of Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 447,199, March 1, 1974, Pat. No. 3,923,533, which is a continuation-in-part of Ser. No. 311,191, Dec. 1, 1972, Pat. No. 3,843,341, which is a continuation-in-part of Ser. Nos. 231,346, March 2, 1972, abandoned, and Ser. No. 264,081, June 19, 1972, abandoned. This application Mar. 26, 1975, Ser. No. 562,064

Int. Cl.² C03C 3/08, 3/04, 3/30

U.S. Cl. 106—54 **1 Claim**

1. A glass composition which, upon being heat treated, separates into a borate-rich phase and a silica-rich phase, comprising:

Component	Percent by Weight
SiO_2	38 – 42
B_2O_3	49 – 52
R_2O (where R is sodium or potassium)	8 – 10
Al_2O_3	0 – 4.

3,972,721

THERMALLY STABLE AND CRUSH RESISTANT MICROPOROUS GLASS CATALYST SUPPORTS AND METHODS OF MAKING

Joseph J. Hammel, and Ties Allersma, both of Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 447,199, March 1, 1974, Pat. No. 3,923,533, which is a continuation-in-part of Ser. No. 311,191, Dec. 1, 1972, Pat. No. 3,843,341, which is a continuation-in-part of Ser. No. 231,346, March 2, 1972, abandoned, and a continuation-in-part of Ser. No. 264,081, June 19, 1972, abandoned. This application Mar. 26, 1975, Ser. No. 562,065

The portion of the term of this patent subsequent to Oct. 22, 1991, has been disclaimed.

Int. Cl.² C03C *3/08, 3/30, 3/04*

U.S. Cl. 106—40 V **3 Claims**

1. A method for making a porous glass article comprising the steps of:

a. fusing a mixture containing 38 to 42 percent by weight SiO_2, 49 to 52 percent B_2O_3, 8 to 10 percent by weight R_2O, where R is sodium or potassium, and 0 to 4 percent by weight Al_2O_3,

b. phase separating such glass into two phases, one of which is a borate-rich phase and the other a silica-rich phase,

c. leaching the phase-separated glass with either water or mineral acid for a time and at a temperature sufficient to remove a major portion of the borate-rich phase to form a porous glass high in silica, and

d. rinsing the porous glass.

3,972,722

ALUMINA-ZIRCON BOND FOR REFRACTORY GRAINS

John P. Holt, Ladue; Theodore Paul Cash, Bonne Terre, and Delbert E. Day, Rolla, all of Mo., assignors to Valley Mineral Products Corporation, St. Louis, Mo.

Filed Mar. 4, 1974, Ser. No. 447,657

Int. Cl.² C04B *35/10, 35/48*

U.S. Cl. 106—57 **8 Claims**

1. A refractory composition comprising:

A. from about 30% to about 80% inactive refractory grain aggregate,

B. from about 6% to about 20% zircon,

C. from about 0.5% to about 10% alkaline earth oxide catalyst,

D. from about 5% to about 45% alumina, and

E. finely ground silica in amount sufficient to prevent formation of low melting alumina-zircon compounds, said silica being present in amount of at least about 5%.

3,972,723

MORTAR OF INORGANIC BINDER AND SULFONIC ACID GROUP-CONTAINING FORMALDEHYDE CONDENSATION PRODUCT WITH CYCLOALKANONE

Gerhard Balle, Cologne; Dieter Dieterich, Leverkusen, and Kurt Schaupp, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 14, 1974, Ser. No. 497,364

Claims priority, application Germany, Aug. 18, 1973, 2341923

Int. Cl.² C04B *7/35*

U.S. Cl. 106—90 **7 Claims**

1. A mortar comprising an inorganic binder and about 0.05 to 5% by weight of the binder of a condensation product comprising a cycloalkanone, about 0.75 to 4 moles of formaldehyde per mole of cycloalkanone, and about 0.1 to 1.2 moles of an alkali metal sulfite or about 0.05 to 0.6 mole of an alkali metal pyrosulfite per mole of a cycloalkanone.

3,972,724

PROCESS OF BURNING FUEL SLATE TO PRODUCE ENERGY AND CEMENT CLINKER AT THE SAME TIME

Karl Entzmann, 10, Eichbergstrasse, A-2371 Hinterbruhl, Austria

Filed Mar. 24, 1975, Ser. No. 561,218

Claims priority, application Austria, Mar. 25, 1974, 2440/74

Int. Cl.² C04B *7/32*

U.S. Cl. 106—103 **8 Claims**

1. A method of processing fuel shale to produce energy and cement clinker therefrom, comprising the steps of:

a. subjecting the dry fuel shale to mechanical disintegration in a pin-type disintegrator in which the particles formed are subjected to repeated acceleration and retardation within a period of less than about 0.05 second, thereby homogenizing and activating at least a part of said shale;

b. admixing with the disintegrated shale finely divided SiO_2, CaO and R_2O_3 in an amount sufficient to form upon sintering a combustion residue consisting essentially of at least about 60% by weight of cement clinker, the remainder ash and slag;

c. subjecting said fuel shale mixture to further mechanical disintegration in a pin-type disintegrator as in step (a);

d. combusting and sintering said disintegrated shale mixture in a furnace to generate heat and to produce said combustion residue;

e. mechanically separating said cement clinker from said ash and slag and recovering the clinker; and

f. subjecting said cement clinker to impact-type disintegration to produce a cement powder.

3,972,725

PRODUCTION OF CRYSTALLINE SUGAR

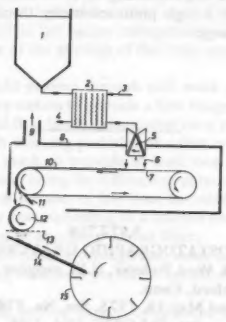
Wilson Menzies Nicol, Reading, England, assignor to Tate & Lyle Limited, London, England

Filed Apr. 9, 1975, Ser. No. 566,617

Claims priority, application United Kingdom, Apr. 16, 1974, 16572/74

Int. Cl.² C13F *1/02*

U.S. Cl. 127—58 **20 Claims**



1. A process for the crystallisation of sugar from a supersaturated sugar syrup, in which the syrup is subjected in a nucleation zone to a shear force having a velocity gradient of at least 5000 cm/sec/cm to induce catastrophic homogeneous nucleation of sugar, the syrup is discharged from said nucleation zone before substantial crystallization has taken place, and the syrup is thereafter crystallised to produce crystalline sugar.

3,972,726

PROCESS FOR MANUFACTURING A NEGATIVE ACCUMULATOR ELECTRODE FOR THE REVERSIBLE STORAGE AND RESTITUTION OF HYDROGEN

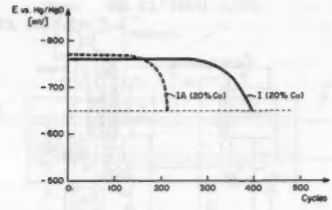
Reimar Schmitt, Chene-Bourgeries,Geneva, Switzerland, assignor to Battelle Memorial Institute, Switzerland

Filed Oct. 17, 1974, Ser. No. 515,617

Claims priority, application Switzerland, Oct. 18, 1973, 14762/73

Int. Cl.² H01M 4/36

U.S. Cl. 136—20 6 Claims



1. A process for manufacturing negative accumulator electrodes having a consolidated porous electrode body with a current-conducting copper matrix and with an active material providing reversible storage and restitution of hydrogen due to electrochemical charging and discharging in an alkaline storage cell, said process comprising the steps of:

a. coating a particulate mass of said active material with copper, by reduction of a copper salt in solution at the surface of the particles of said mass, in such a manner as to deposit on said particles surface a copper coating which is permeable to hydrogen; and

b. sintering together the copper coatings on the resulting coated particles of said active material, by subjecting said mass of coated particles to hot-pressing in such a manner as to consolidate said porous electrode body by means of a copper matrix formed by sintering said copper coatings.

3,972,727

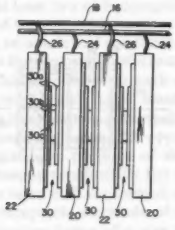
RECHARGEABLE BATTERY WHICH COMBATS SHAPE CHANGE OF THE ZINC ANODE

Ernest M. Cohn, Washington, D.C., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 13, 1975, Ser. No. 604,374

Int. Cl.² H01M 4/38

U.S. Cl. 136—30 8 Claims



1. In a secondary power source, comprising at least one rechargeable electrochemical cell, comprising a housing, at least one cathode electrode located within the housing, at least one zinc anode electrode located within the housing, a separator between the electrodes, and an electrolyte for enabling ion transfer between said electrodes, the improvement wherein said separator profiles the ionic conductivity between the electrodes so that ion flow is greatest at the edges of the electrodes and least at the center of the electrodes, so as to combat migration of the zinc ions of the anode electrode from the edge thereof to the center thereof.

3,972,728

SHEATH FOR TUBULAR STORAGE, BATTERY ELECTRODES AND METHOD FOR THEIR PRODUCTION

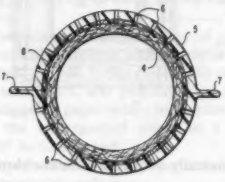
Erik G. Sundberg, Nol, and Erik Westberg, Lidingo, both of Sweden, assignors to Aktiebolaget Tudor, Sweden

Filed Dec. 17, 1974, Ser. No. 533,499

Claims priority, application Sweden, Dec. 17, 1973, 7316973; Aug. 26, 1974, 7410769

Int. Cl.² H01M 4/80

U.S. Cl. 136—43 9 Claims



1. A sheath for tubular electrodes for electric storage batteries, each tubular electrode comprising a number of electricity-conducting bars connected with one another, surrounded by active material, which in turn is surrounded by an electro-chemically inactive sheath, said sheath consisting of an annular layer of an inert fibrous material and, on the outside of the latter, a foraminous annular layer of thermoplastic material, the outer fibers only of said fibrous material being embedded into the inner facing surface of the thermoplastic material to an extent sufficient for the two layers to be mechanically connected with each other.

3,972,729

METHOD OF PRODUCING ELECTRODES

Jacques Mosetti; Klaus D. Beccu, and Pierre Jonville, all of Geneva, Switzerland, assignors to Centre National d'Etudes Spatiales, Paris, France

Continuation of Ser. No. 433,671, Jan. 16, 1974, abandoned, which is a continuation-in-part of Ser. No. 232,762, March 8, 1972, abandoned. This application Nov. 24, 1975, Ser. No. 634,525

Claims priority, application Switzerland, June 30, 1971, 9587/71

Int. Cl.² H01M 35/18

U.S. Cl. 136—75 3 Claims

1. A method of producing electrodes for cells of primary or secondary batteries, comprising the steps of:

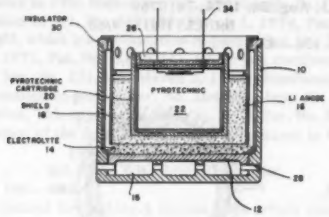
mixing a comminuted active compound, selected from the group which consists of NiF_2, CdF_2 and $KCdf_3$, with nickel powder in a proportion sufficient to form upon sintering a porous and coherent metallic body permeated by said active compound; and

sintering said nickel powder by subjecting the resulting mixture to a hot-pressing operation at a treatment temperature lying between substantially 300° and 700°C within a range of thermal stability of said active compound and under a pressure, ranging between substantially 100 and 2000 kg/cm², sufficient to cause cohesion of the particles of said nickel powder at said treatment temperature to form said metallic body, thereby preventing any transformation or volatilization of said active compound during said hot-pressing operation.

3,972,730
PYROTECHNICALLY ACTIVATED LITHIUM-CHLORINE CELL

Frederic M. Bowers, Silver Spring; Judith H. Ambrus, Beltsville; George S. Briggs, Adelphi; Michael E. DeGraba, Kensington, all of Md.; Gary L. Green, Pine Bluff, Ark.; Allan S. Kushner, Silver Spring, Md., and Donald L. Warburton, Fulton, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 25, 1975, Ser. No. 590,242
Int. Cl.² H01M 8/14, 6/36
U.S. Cl. 136—86 A **12 Claims**



1. A pyrotechnically activated lithium-chlorine primary cell comprising:

a cell case;

a porous graphite wafer positioned within the cell case to provide a gas receiving chamber;

a fused salt electrolyte contiguous to the porous graphite wafer;

an anode comprising a metal shield which contains a lithium impregnated metal matrix, the anode being in contact with the electrolyte and insulated from the cell case by a refractory electrical insulator, wherein the metal of the shield and the metal of the matrix are selected from the group consisting of nickel and nickel alloys;

a metal cartridge containing a pyrotechnic material, the cartridge being disposed within the anode, wherein the metal is selected from the group consisting of nickel and nickel alloys;

a source of Cl_2 gas;

means to introduce the Cl_2 gas into the gas receiving chamber; and

means to activate the pyrotechnic material; wherein, chlorine gas is introduced into the gas receiving chamber and passed through the porous graphite wafer as the pyrotechnic material is activated thereby providing sufficient heat to melt the electrolyte, and to heat the entire cell to its operating temperature, thus generating the flow of ions between the cell electrodes.

3,972,731
PRESSURIZED FUEL CELL POWER PLANT

David P. Bloomfield, and Ronald Cohen, both of West Hartford, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 12, 1975, Ser. No. 549,600
Int. Cl.² H01M 8/06
U.S. Cl. 136—86 R **19 Claims**

1. In the process for generating electricity in a power plant comprising a compressor operably connected to a turbine, reactor means, and a fuel cell stack including a plurality of fuel cells connected electrically in series through a load, each cell comprising a cathode electrode, an anode electrode, an electrolyte disposed therebetween, a cathode gas space on the nonelectrolyte side of said cathode electrode and an anode gas space on the nonelectrolyte side of said anode electrode, the steps of:

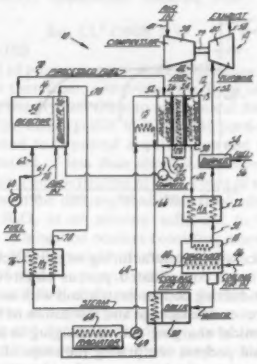
compressing air to greater than two atmospheres in said compressor;

delivering said compressed air at greater than two atmospheres from said compressor into said cathode gas space;

delivering a pressurized hydrogen containing fuel into said reactor means;

producing hydrogen in said reactor means;

delivering pressurized hydrogen from said reactor means into said anode gas space;



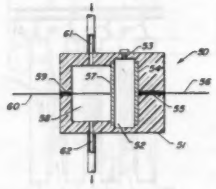
burning anode effluent gases to provide heat for said step of producing hydrogen; and

adding energy to said pressurized cathode effluent gases downstream of said cathode gas space and thereafter delivering said pressurized cathode effluent gases into said turbine for powering said turbine to drive said compressor.

3,972,732
ELECTROCHEMICAL CELL

Rudolf H. Hausler, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 375,984, July 2, 1973, Pat. No. 3,881,957, which is a continuation-in-part of Ser. No. 235,772, March 17, 1972, abandoned. This application Feb. 10, 1975, Ser. No. 549,238
Int. Cl.² B01K 1/00
U.S. Cl. 136—86 D **16 Claims**



1. In an electrochemical cell, an electrode therefor comprising a refractory oxide having a surface area from 1 to 500 square meters per gram, and a carbonaceous pyropolymer forming at least a monolayer on said refractory oxide, said electrode having a conductivity at room temperature of from 10^0 to 10^3 inverse ohm-centimeters.

3,972,733

METHOD FOR PRODUCING ELECTRICAL ENERGY BY MEANS OF LIQUID CRYSTAL DEVICES

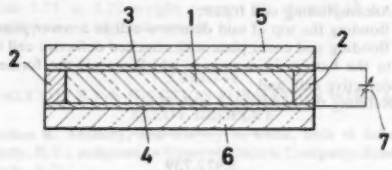
Hirotake Kamei, Kunitachi; Takeo Ozawa, Higashi-Kurume; Ken Nozaki, Tokyo, and Takitaro Morikawa, Sayama, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Continuation of Ser. No. 222,246, Jan. 31, 1972, abandoned. This application Jan. 21, 1974, Ser. No. 435,119

Claims priority, application Japan, Jan. 29, 1971, 46-2848; Mar. 12, 1971, 46-13117; Mar. 20, 1971, 46-15513; May 26, 1971, 46-35502; June 6, 1971, 46-46857; Sept. 1, 1971, 46-66602

Int. Cl.² H01L *31/08*

U.S. Cl. 136—89 7 Claims



1. A method for producing electrical energy by means of a liquid crystal device comprising, in combination, a pair of opposing electrodes disposed in paralleling planes, at least one of said electrodes being transparent, a sealed space between said electrodes containing a nematic liquid crystal, a pair of terminals each connected to each of said electrodes, and a utilization means connected between said terminals and disposed to receive a voltage from said liquid crystal, passing light rays through said transparent electrode of said liquid crystal device, and thereby producing voltage across said terminals to electrically activate said utilization means.

3,972,734

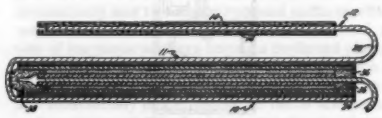
THERMAL DEFERRED ACTION BATTERY

Ellwood J. King, Towson, Md., assignor to Catalyst Research Corporation, Baltimore, Md.

Filed Dec. 27, 1957, Ser. No. 705,713

Int. Cl.² H01M *6/36*

U.S. Cl. 136—90 3 Claims



1. In a battery, at least two cells comprising a first cell and a second cell spaced from, but adjacent to, said first cell, each of said cells having an anode and a cathode and having a solid electrolyte between the opposing surfaces of said electrodes in each cell, one of said electrodes in each of said cells being formed of a thin rectangular metal blank folded along its transverse axis with the resulting rectangular portions thereof being in parallel planes and having the opposing side edges of those resulting rectangular portions of the folded member sealed together, whereby substantially flat rectangular receptacles each with an open end are formed, an extension from a side wall of said receptacle electrode of said first cell at its open end, said extension being of a size that is as large as possible consistent with fitting within the receptacle electrode of said second cell and being disposed in said receptacle electrode of said second cell, said receptacle electrode of said first cell and said extension being a single piece of metal, a second metal on the surfaces of said single piece of metal in one of said cells, whereby the resulting unit is an anode in one of said cells and a cathode in the other said extension being deformed adjacent the end of the receptacle electrode with which it is integral and lying in a plane above and substantially parallel to the plane of the receptacle electrode with which it is integrally connected, whereby the cells of said battery form a stack of cells.

3,972,735

METHOD FOR MAKING ELECTRODES FOR ELECTROCHEMICAL CELLS

Richard D. Breault, Coventry, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 442,961, Feb. 15, 1974, abandoned, which is a division of Ser. No. 268,258, July 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 98,934, Dec. 16, 1970, abandoned. This application Apr. 4, 1975, Ser. No. 565,179

Int. Cl.² H01M *13/02*

U.S. Cl. 136—122 5 Claims

1. A method for making an electrode for an electrochemical cell, comprising:

forming a substrate including the step of coating the fibers of a fibrous carbon paper with pyrolytic carbon wherein said pyrolytic carbon forms electrically conductive bonds between said fibers, wet proofing said coated paper by impregnating said paper with a hydrophobic polymer, and sintering the impregnated paper at a temperature of about 580° to 630°F; and

applying a layer to the sintered paper consisting of a catalyst and a hydrophobic polymer.

3,972,736

STORAGE BATTERY

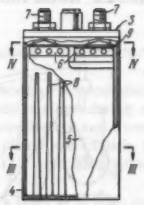
Mikhail Stepanovich Tsygankov, ulitsa Ordzhonikidze 14, kv. 24; Nina Alexandrovna Bitjutskaya, ulitsa Stepana Razina, 36, kv. 18; Vera Nikonorovna Fateeva, ulitsa Ordzhonikidze, 14, kv. 28; Valery Nikolaevich Kosholkin, Novo-Astrakhanskoe shosse, 43, kv. 47; Boris Dmitrievich Karev, ulitsa Millerovskaya 73a, kv. 4; Nikolai Alexeevich Kudinov, ulitsa Chapaeva, 128; Mars Mikhailovich Kholkin, ulitsa Chapaeva, 29, kv. 28; Nikolai Nikiforovich Moiseev, prospekt Kirova, 15, kv. 4, and Oleg Georgievich Malandin, ulitsa Sovetskaya, 23, kv. 23, all of Saratov, U.S.S.R.

Filed Feb. 22, 1974, Ser. No. 444,982

Claims priority, application U.S.S.R., Feb. 26, 1973, 1887424

Int. Cl.² H01M *2/02*

U.S. Cl. 136—163 2 Claims



1. A storage battery comprising a container; cells installed in said container and series-connected by intercell connectors; jars with electrolyte of said cells containing plate groups assembled from plates with the aid of elements which fasten terminal posts to the plates; vertical ribs in each of said battery cells located on the internal surfaces of two opposite walls facing the surfaces of the end plates of said plate group and ensuring circulation of electrolyte in the electrolyte layer around said plate groups; a dielectric plate located in said cell and resting freely on said elements fastening the terminal posts

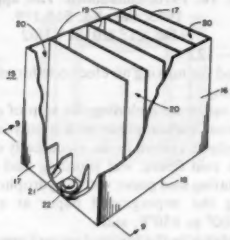
to the electrodes, said plate being an imperforate sheet material provided with openings through which the terminal post extend.

3,972,737

MULTI-PARTITIONED THIN-WALLED CONTAINER

Robert D. Sullivan, and Gottfried W. Jutte, both of Indianapolis, Ind., assignors to The Richardson Company, Des Plaines, Ill.

Continuation of Ser. No. 371,276, June 18, 1973, abandoned, which is a division of Ser. No. 143,969, May 17, 1971, Pat. No. 3,767,156. This application Nov. 25, 1974, Ser. No. 527,116
Int. Cl.² H01M 2/02
U.S. Cl. 136—166 7 Claims



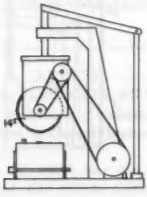
1. A multi-partitioned container adapted for use as a battery box, said container comprising a unitary body having an interior defined by a pair of side walls extending between the terminal portions of a pair of integral end walls, a bottom wall integral with the lowermost portion of each of said side and end walls, and a plurality of uniformly spaced partitions integral with said side and bottom walls dividing said body interior into a plurality of individual cell compartments, said walls and partitions being of uniform thickness of approximately 0.2 inches or less, the interior surface of said bottom wall being substantially planar and free of interiorly extending indentations except for only a single gate sealing indentation extending into each of said cell compartments.

3,972,738

METHOD FOR REPAIR OF PLASTIC-CASED BATTERIES

Joe Bernaldo, 1307 E. Elm, Tampa, Fla. 33604

Filed July 31, 1975, Ser. No. 600,796
Int. Cl.² H01M 10/54
U.S. Cl. 136—174 2 Claims



1. A method for removing and replacing a portion of the sealed top of a defective automotive or marine battery for the purpose of repair of defective cells or cell connectors comprising

a. Starting with

i. A sealed battery with defective cell or cell connector,

ii. A pair of larger parallel rotating circular cutting blades displaced from each other a distance less than the width of said defective battery cell,

iii. A pair of smaller parallel rotating circular cutting blades displaced from each other a distance less than the length of said defective battery cell,

iv. A cover plate, and

v. A bonding means;

b. Removing fluid from the battery cell;

c. Placing the defective cell of the battery under one pair of rotating circular cutting blades and causing said blades to cut slots on opposite two of the four sides of the top of said defective cell;

d. Placing the defective cell of the battery under the other pair of rotating circular cutting blades and causing said blades to cut slots on the remaining two of the four sides of the top of said defective cell;

e. Removing the top of said defective cell for the purpose of repair;

f. Accomplishing said repair;

g. Bonding the top of said defective cell to a cover plate;

h. Bonding said cover plate with attached defective cell top to the battery in a manner which reseals the formerly defective cell; and

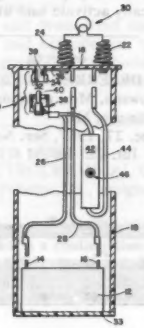
i. Refilling the battery cell with fluid.

3,972,739

RECHARGEABLE BATTERY WITH CURRENT LIMITING MEANS

Ronald O. Hammel, Englewood, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Nov. 28, 1975, Ser. No. 636,258
Int. Cl.² H01M 10/48
U.S. Cl. 136—181 4 Claims



1. In a rechargeable battery having an enclosure, a self-contained battery or plurality of self-contained electrochemical cells disposed in the enclosure and having first and second terminals, output terminals mounted exteriorly on the enclosure, and a recharge jack mounted exteriorly on the enclosure and having leads connected to the first and second terminals of the battery, the improvement comprising:

a low resistance, high power current-limiting means connected between one of the output terminals and the corresponding polarity first or second terminal of the battery;

heat indicating means in close proximity or directly affixed to the current-limiting means for indicating whether a threshold level of current corresponding to a short-circuit across the output terminals had been carried by the current-limiting means.

3,972,740

THERMOCOUPLE WITH IMPROVED EMF STABILITY

Carrol Dean Starr, Whippany, and Teh Po Wang, North Caldwell, both of N.J., assignors to Wilbur B. Driver Company, Newark, N.J.

Filed July 31, 1975, Ser. No. 600,266
Int. Cl.² H01L 23/18
U.S. Cl. 136—239 3 Claims

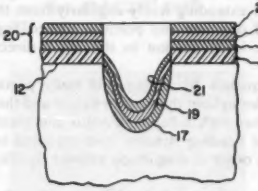
1. A thermocouple consisting essentially of a positive thermoelement wire and a negative thermoelement wire metallurgically joined together, the positive thermoelement wire consisting essentially of an alloy of from about 13.75 to 14.75 weight percent Cr, about 1.25 to 1.75 weight percent Si, about .05 to 0.15 weight percent Mg, balance Ni, and the negative thermoelement wire consisting essentially of an alloy of from about 3.75 to 4.25 weight percent Si, about 0.10 to 0.20 weight percent Mg, balance Ni.

3,972,741

MULTIPLE P-N JUNCTION FORMATION WITH AN ALLOY DROPLET

Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 464,801, April 29, 1974, abandoned. This application Jan. 30, 1975, Ser. No. 545,530
Int. Cl.² H01L 7/34
U.S. Cl. 148—1.5 58 Claims



1. A process for making a semiconductor device comprising the process steps of:

a. selecting a body of semiconductor material having a predetermined level of resistivity, a predetermined type conductivity and two major opposed surfaces which are, respectively, the top and bottom surfaces thereof, at least one of the major surfaces having a preferred planar crystal structure orientation and a vertical axis which is substantially parallel with a first axis of the crystal structure and substantially perpendicular to the at least one major surface having the preferred crystal planar orientation;

b. depositing a predetermined thickness of a layer of material of a predetermined composition having at least two different dopant impurities therein, suitable for doping a predetermined semiconductor material, on a predetermined portion of the at least one major surface of the body having the preferred crystal planar orientation, the layer of material having a predetermined geometrical configuration, and each dopant impurity material having a different rate of diffusivity in the semiconductor material;

c. heating the body and the material deposited thereon to an elevated temperature sufficient to form a melt of each layer of deposited material and portion of the semiconductor material in contact therewith;

d. establishing a temperature gradient across the body between the two opposed major surfaces, wherein the surface upon which the melt is formed is at the lower temperature;

e. migrating each melt through the entire body from the surface of lower temperature to the surface of higher temperature to form a region of recrystallized semiconductor material of the body having solid solubility of the deposited material therein, and

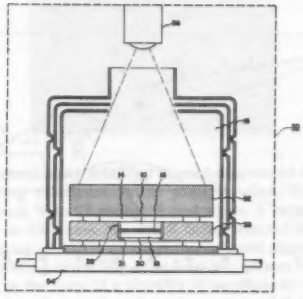
f. heating the processed body to an elevated temperature for an elapsed period of time sufficient to allow a portion of the dopant impurity materials to diffuse outward from the region of recrystallized material into the mutually adjacent semiconductor material of the body to form a second region of diffused semiconductor material of the body having a second predetermined type conductivity and a predetermined level of resistivity, and the type conductivity and level of resistivity being determined by the dopant impurity material having the highest diffusivity, the level of concentration of the dopant impurity material in the second region being substantially the same throughout any given plane which is substantially parallel to the abutting surfaces of the first and second regions and the level of resistivity in the second region increasing with increasing distance from the interface of the first and second region in any plane which is substantially perpendicular thereto.

3,972,742

DEEP POWER DIODE

Harvey E. Cline, and Thomas R. Anthony, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 411,011, Oct. 30, 1973. This application Nov. 22, 1974, Ser. No. 526,145
The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.
Int. Cl.² H01L 7/42
U.S. Cl. 148—1.5 9 Claims



1. A process for making a semiconductor device comprising:

a. selecting a first body of semiconductor material having two major opposed surfaces being respectively the top and bottom surfaces thereof and a preferred crystal structure of a (111) planar orientation for at least the top surface and a <111> crystallographic axis as the vertical axis of the body;

b. vapor depositing a layer of at least one metal of a predetermined thickness on, and in intimate contact with, the top surface of the body;

c. placing the first body of semiconductor material on a second body of semiconductor material having two major opposed surfaces comprising respectively the top and bottom surfaces thereof wherein the layer of vapor deposited metal on the top surface of the first body is in an abutting contact relationship wih the top surface of the second body;

d. heating the two bodies and the vapor deposited layer of metal to a predetermined elevated temperature sufficient to form a melt of metal-rich semiconductor material of the two bodies as the abutting interface of the same;

e. establishing a temperature gradient throughout the two bodies of semiconductor material substantially aligned with the <111> axis of the first body wherein the bottom surface of the first body is at the higher temperature;

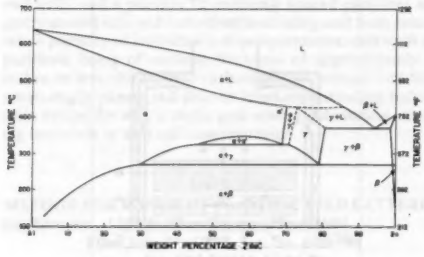
f. migrating the melt of metal-rich semiconductor material through the first body of the semiconductor material along the <111> crystal axis from the top surface toward the bottom surface, and

g. growing a region of recrystallized semiconductor material of the first body integral with the material of the second body from the migrating melt of metal-rich semiconductor material as it moves through the first body, the region of recrystallized material having solid solubility of the vapor deposited metal therein, the solid solubility of the metal being determined by the elevated temperature at which migration is practiced and imparting a predetermined level of resistivity and a predetermined type conductivity to the grown region, the region having the crystallographic structure of the second body.

3,972,743
HIGH STRENGTH, STABLE ZINC-ALUMINUM ALLOY

David L. Dollar; Raymond E. Giuliani; Michael J. Mirra, and Jon W. Headrick, all of Greeneville, Tenn., assignors to Ball Corporation, Muncie, Ind.

Filed Oct. 20, 1975, Ser. No. 623,709
Int. Cl.² C22C *18/04*; C22F *1/16*
U.S. Cl. 148—11.5 R 15 Claims



1. Method of manufacturing a stable, two-phase, high strength alloy, having enhanced mechanical properties, having a high tensile strength which comprises:

subjecting a Zn/Al/Cu/Mg alloy containing from about 20 to 28 weight percent aluminum, from about 0.1 to 3.5 weight percent copper, about 0.01 to 0.5 weight percent magnesium, and the remainder zinc, to a temperature and for a time to effect homogenization of said alloy,

working the homogenized alloy at a temperature above the eutectoid transformation temperature to attain between about 10 to 75 percent reduction,

quenching the worked alloy,

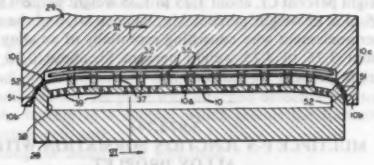
providing an effective temperature for a period of time to produce transformation into a two-phase alloy,

and cooling the transformed two-phase alloy to ambient temperature.

3,972,744
METHOD OF AND MEANS FOR MAKING LIGHTWEIGHT, LOW COST IMPACT RESISTANT BUMPERS

Ronald G. Cantrell, Huntington, W. Va., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Continuation-in-part of Ser. No. 441,064, Feb. 11, 1974, Pat. No. 3,905,630. This application July 15, 1975, Ser. No. 596,175
Int. Cl.² C21D *7/00*, *9/00*
U.S. Cl. 148—12.4 29 Claims



1. A method of making a bumper bar of a length to be mounted protectively horizontally across an end of an automotive vehicle, comprising:

shaping a suitable length of easily workable relatively thin gauge sheet or strip steel into bumper bar shell profile provided with a horizontaly elongated body portion and spaced apart integral upper and lower flanges of substantial width extending freely angularly from the body portion, and opposite end portions turned angularly away from the body portion in the same direction as said flanges;

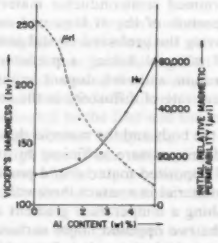
heat and quench hardening said body portion and said flanges throughout their major extent and thereby providing the bar with a beam strength and yield strength to withstand bending stresses from repeated impact forces of a high order of magnitude without significant damage; and

maintaining said opposite end portions free from heat and quench hardening as warpage control areas and thereby maintaining the bumper bar free from detrimental warpage.

3,972,745
NI-FE-AL MATERIAL HAVING HIGH MAGNETIC PERMEABILITY

Tomoo Yamagishi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 358,473, May 9, 1973, abandoned. This application Mar. 4, 1975, Ser. No. 555,303
Claims priority, application Japan, June 2, 1972, 47-55442
Int. Cl.² C04B *35/00*
U.S. Cl. 148—31.55 5 Claims



1. A high magnetic permeability heat-treated alloy for recording and reproducing heads, consisting essentially of

Element	% by Weight
Ni	75 – 82
Fe	5 – 24
Al	1 – 5
Mo	0 – 6
Cu	0 – 15

and at least one additive, said additive being

Element	% by Weight
Nb	2 – 7
Si	0.4 – 2
Cr	1 – 5

, or a mixture thereof

wherein said μ_{rl} is at least 10,000 and said Hv is at least 160, said alloy having an initial relative magnetic permeability (μ_{rl}) expressed in line μ_{rl} of FIG. 1 of the drawings and a Vicker's hardness (Hv) expressed by line Hv of FIG. 1 of the drawings as the aluminum content of the alloy increases from 1 to 5%.

3,972,746

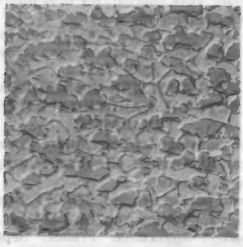
CO-SI-X ALIGNED EUTECTICS

James D. Livingston, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 2, 1975, Ser. No. 609,593

Int. Cl.² C22C *19/07*

U.S. Cl. 148—32 6 Claims



4. A unidirectionally solidified aligned eutectic of a Co-Si-X alloy having significant tensile strength where Si ranges from 21 atomic % to 27 atomic % and where X ranges from 1 atomic % to 8 atomic %, said X being selected from the group consisting of Ta, Nb, V or alloys thereof, said aligned solid eutectic consisting essentially of at least two phases with one phase being in the form of a plurality of rods of irregular circumference and/or lamellae passing through a matrix of the second phase, said rods and/or lamellae being significantly parallel to each other, said aligned eutectic being substantially or completely free of dendrites.

3,972,747

CO-SI-X ALIGNED EUTECTICS

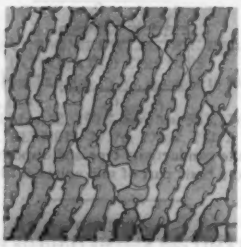
James D. Livingston, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 2, 1975, Ser. No. 609,592

Int. Cl.² C22C *19/07*

U.S. Cl. 148—32 6 Claims

4. A unidirectionally solidified aligned eutectic of a Co-Si-X alloy having significant tensile strength where Si ranges from 21 atomic % to 27 atomic % and where X ranges from 1 atomic % to 4 atomic %, said X being selected from the group consisting of W, Mo or alloys thereof, said aligned solid eutectic consisting essentially of at least two phases in the form of substantially alternating lamellae significantly parallel to each other and substantially uniformly distributed throughout said aligned eutectic having an average interlamellar spacing ranging from about 2 microns to 20 microns, said aligned eutectic being substantially or completely free of dendrites.



3,972,748

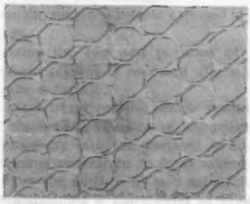
CO-SI-X ALIGNED EUTECTICS

James D. Livingston, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 2, 1975, Ser. No. 609,591

Int. Cl.² C22C *19/07*

U.S. Cl. 148—32 6 Claims



4. A unidirectionally solidified aligned eutectic of a Co-Si-X alloy having significant tensile strength where Si ranges from 21 atomic % to 27 atomic % and where X ranges from 2 atomic % to 10 atomic %, said X being selected from the group consisting of Al, Ga or alloys thereof, said aligned solid eutectic consisting essentially of at least two phases with one phase being in the form of a plurality of significantly uniform rods and/or lamellae passing through a matrix of the second phase, said rods and/or lamellae being significantly parallel to each other and having an average diameter or thickness ranging from about 3 microns to about 30 microns, said aligned eutectic being substantially or completely free of dendrites.

3,972,749

SEMICONDUCTOR LIGHT SOURCE ON THE BASIS OF SILICON CARBIDE SINGLE CRYSTAL

Vadim Ivanovich Pavlichenko, ulitsa Polevaya 20/1, Kaliningrad, Moskovskaya oblast, U.S.S.R.

Filed Sept. 6, 1973, Ser. No. 394,715

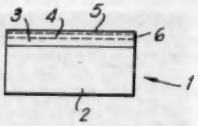
Claims priority, application U.S.S.R., Sept. 15, 1972, 1828718

Int. Cl.² H01L *21/00*

U.S. Cl. 148—33 3 Claims

1. A silicon carbide semiconductor light device capable of electroluminescence, comprising a basic silicon carbide single crystal of low resistance having uncompensated impurity atoms therein of given conductivity type, an epitaxial silicon carbide film thereon having uncompensated impurity atoms therein of said conductivity type, a first layer of low ohmic resistance having impurity atoms therein of opposite conduc-

tivity type formed in the surface of said epitaxial film, and a second layer of high ohmic resistance having impurity atoms



of said opposite conductivity type and disposed between said first layer and a basic part of said epitaxial film.

3,972,750

ELECTRON EMITTER AND METHOD OF FABRICATION

William A. Gutierrez, and Herbert L. Wilson, both of Woodbridge, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 30, 1975, Ser. No. 573,289

Int. Cl.² H01L *21/20*

U.S. Cl. 148—171 **10 Claims**

1. A method of fabricating a transmission mode gallium arsenide electron emitter comprising the steps of:

preparing a p-doped gallium arsenide seed crystal for growth by chemically polishing the growth surface;

epitaxially growing an etch stop layer of lightly n-doped gallium arsenide onto the prepared surface of the seed crystal;

epitaxially growing a p-doped gallium arsenide emitter layer onto the etch stop layer;

epitaxially growing a lightly p-doped gallium aluminum arsenide passivating window layer onto the emitter layer;

preferentially removing the gallium arsenide seed crystal from the etch stop layer;

preferentially removing the gallium arsenide etch stop layer from the emitter layer; and

providing ohmic contact means for the exposed surface of the emitter layer.

10. The photocathode resulting from the practice of the fabrication method of claim **1.**

3,972,751

METHOD OF HEAT TREATING FERROUS WORKPIECES

William E. Engelhard, Apalachin, N.Y., assignor to Owego Heat Treat, Inc., Apalachin, N.Y.

Continuation-in-part of Ser. No. 380,067, July 17, 1973, abandoned. This application June 30, 1975, Ser. No. 592,040

Int. Cl.² C21D *1/00*

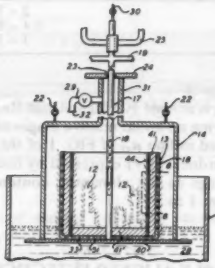
U.S. Cl. 148—149 **40 Claims**

1. The method of automatically cooling ferrous work in a work holder to harden the same uniformly, said work having been preheated to impart uniform characteristics to said work, said method comprising:

a. forming said work holder of generally upwardly opening form to receive said work therein, with a vertical outer wall on said work holder to encompass said work,

b. forming said vertical wall with apertures for contact with and flow therethrough of quenching medium for quenching said work in said holder,

c. providing said fluid quenching medium in a quenching tank of larger dimensions than said work holder, for freely receiving the latter therein,



d. positioning the work and work holder receiving the same in alignment with said fluid quenching medium tank, and

e. moving the work holder with the work therein into said quenching medium, so that the quenching medium will flow through the vertically apertured wall into the holder and onto said work therein, for heat interchange therewith, thereby cooling the work.

3,972,752

ALLOYS HAVING A NICKEL-IRON-CHROMIUM BASE FOR STRUCTURAL HARDENING BY THERMAL TREATMENT

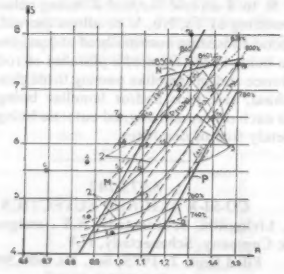
Yves Honnorat, Sauvingy-les-Bois; André Pineau, Evry, and Ricardo Cozar, Ris-Orangis, all of France, assignors to Creusot-Loire, Paris, France

Continuation-in-part of Ser. No. 288,071, Sept. 11, 1972, abandoned. This application Aug. 14, 1974, Ser. No. 497,478

Claims priority, application France, Sept. 28, 1971, 71.34871

Int. Cl.² C22F *1/10*

U.S. Cl. 148—162 **3 Claims**



1. Method of preparation of an alloy comprising the steps of:

preparing an alloy consisting essentially of:

15 to 25 percent iron,

15 to 25 percent chromium,

0.01 to 0.2 percent carbon,

up to 0.35 silicon,
up to 0.35 percent manganese,
up to 0.01 percent sulphur,
up to 0.01 percent phosphorus,
2.5 to 9 percent molybdenum,
1.5 to 6.5 percent niobium, up to half of which can be replaced by tantalium,
0.5 to 1.5 percent titanium,
0.3 to 1.5 percent aluminium,
up to 0.01 percent boron,
and the remainder nickel, having a

$$\text{ratio } R \text{ of atomic percentages} \quad \frac{\text{titanium + aluminium}}{\text{niobium + tantalium}}$$

and sum S of atomic percentages of titanium + aluminium + niobium + tantalium, within the area defined by lines M, N, P, of FIG. 3,

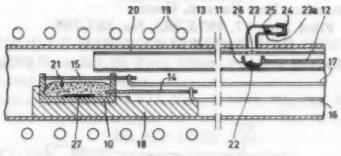
placing the alloy in solution at temperatures between 925°C and 1060°C, followed by a quick cooling,

aging the alloy at a first level of temperature and exposure time to obtain a precipitation of cubes of at least 200A of a γ' phase with centered faces approximately Ni_3 (Ti, Al, Nb) prior to a precipitation of plates of phase γ'' of centered tetragonal structure approximately Ni_3 (Nb, Ta) and reducing the temperature to a second level of at least 700°C.

3,972,753
METHOD FOR THE EPITAXIAL GROWTH FROM THE LIQUID PHASE

Bernard Legros, and Claude Marie, both of Caen, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 15, 1974, Ser. No. 524,315
Claims priority, application France, Nov. 15, 1973, 73.40670
Int. Cl.² H01L *7/38*
U.S. Cl. 148—171 **3 Claims**



1. A method for the successive epitaxial deposition on a semiconductor substrate of a first semiconductor layer and at least one further semiconductor layer, said layers differing mutually as to at least their conductivity properties and having been obtained by crystallization from a material in the liquid phase, comprising the steps of:

a. placing said substrate and said material in a crucible in contact with each other;

b. disposing said crucible in a certain space which is partially exposed to the thermal radiation of a furance having a horizontal axis so as to render said material in a liquid state;

c. forming said first layer with said material;

d. providing at least during the whole period of the growth of said first epitaxial layer at least one dopant in a container which is present inside said space at a part thereof removed from said thermal radiation and is independent of said crucible, said container being connected to means present outside said space for the independent movement of said container;

e. after the growth of the first epitaxial layer arranging said container above said crucible and turning it upside down to provide to said material at least once an extra addition of said at least one dopant; and

f. forming said further layer with said at least one dopant.

3,972,754
METHOD FOR FORMING DIELECTRIC ISOLATION IN INTEGRATED CIRCUITS

Jacob Riseman, Poughkeepsie, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Filed May 30, 1975, Ser. No. 582,336
Int. Cl.² H01L *21/76, 27/04, 21/22*
U.S. Cl. 148—175 **6 Claims**

1. In the fabrication of integrated circuits, a method for forming dielectrically isolated regions in a silicon substrate comprising

forming over a silicon substrate surface of one-type conductivity a first mask comprising silicon nitride having a plurality of openings therethrough,

etching to recess the silicon substrate exposed in said plurality of openings,

thermally oxidizing the recessed portions of the silicon substrate to form regions of recessed silicon dioxide extending into the substrate,

removing said mask to expose the silicon substrate,

carrying out a blanket introduction of impurities of opposite-type conductivity into the portions of the substrate surface remaining unoxidized to form regions which do not extend from the surface of said substrate to a substrate depth beyond that of the regions of recessed silicon dioxide,

epitaxially depositing a layer of silicon of said opposite-type conductivity on said substrate surface,

forming over said epitaxial layer a second mask comprising silicon nitride having a plurality of openings therethrough, in registration with said plurality of openings in said first mask,

etching to recess the silicon epitaxial layer exposed in said plurality of openings in said second mask, and

thermally oxidizing the recessed portions of said epitaxial layer to an extent sufficient to form regions of recessed silicon dioxide extending through said epitaxial layer into registered contact respectively with said regions of recessed silicon dioxide formed in the substrate.

3,972,755
DIELECTRIC CIRCUIT BOARD BONDING

Charles C. Misfeldt, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 315,037, Dec. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 52,868, Dec. 14, 1972, abandoned. This application Oct. 29, 1974, Ser. No. 518,314
Int. Cl.² C23F *1/02;* **B29D** *3/00;* **C09J** *5/00*
U.S. Cl. 156—3 **13 Claims**

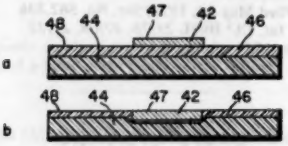
1. A process for the manufacture of microwave stripline circuit boards or the like including:

A. attaching together a relatively thick, partly cured dielectric substrate of thermosetting plastic material and a sheet of bonding film consisting essentially of an electrically

compatible heat settable plastic about 0.002 in. thick to form a dielectric laminate;

B. attaching a conductive foil to said film to form a clad composite board;

C. pressing said composite board between temperature controlled press plates sufficiently to cause said conductive material and said substrate to be adhered by said film while said substrate remains partly uncured;



D. etching away portions of said conductive material to form a desired electrical circuit;

E. machining said board to finished size and shape;

F. placing the etched and machined board in a mold container confining said board in all dimensions;

G. pressing the board at a controlled temperature and pressure sufficient to completely cure said film and substrate and cause said conductor and said film to form together a flush level board surface.

3,972,756

METHOD OF PRODUCING MIS STRUCTURE

Akira Nagase; Masayasu Tsunematsu, both of Kodaira; Norio Anzai, Tokorozawa, and Akihiro Tomozawa, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 26, 1973, Ser. No. 400,924

Claims priority, application Japan, Sept. 27, 1972, 47-96157

Int. Cl.² H01L 7/50

U.S. Cl. 156—17 **6 Claims**

1. In a method of manufacturing a silicon gate MOS field-effect transistor wherein an oxide film is thermally formed on a silicon substrate, a polycrystalline silicon layer is formed on said oxide film, parts of said oxide film and said polycrystalline silicon layer are etched to form a gate and simultaneously expose parts of said substrate, pent roof portions of the polycrystalline silicon layer extending over said oxide film being formed as a result of the etching of parts of said oxide film and said polycrystalline silicon layer, and impurities are doped into said substrate with said gate used as a mask to thereby form a source and a drain,

the improvement comprising the step of:

completely removing said pent roof portions of said polycrystalline silicon layer resulting from the etching of said oxide film and said polycrystalline silicon layer by etching a surface of said polycrystalline silicon layer after the formation of said gate or after the doping of said impurities by the use of a liquid etchant whose etching rate is larger for said polycrystalline silicon layer than for said oxide film.

3,972,757

MANUFACTURE OF VULCANIZED ELASTOMERIC HOSE

Carl Derderian, Cheshire, and Robert Miller, Woodbridge, both of Conn., assignors to Uniroyal Inc., New York, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,660

The portion of the term of this patent subsequent to July 16, 1991, has been disclaimed.

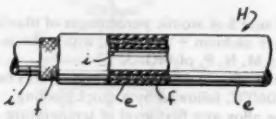
Int. Cl.² B29C 25/00

U.S. Cl. 156—143 **10 Claims**

1. In the method of producing vulcanized reinforced elastomeric hose having a body construction characterized by a plurality of tubular layers of elastomeric material and at least one layer of filamentary reinforcement material between each proximate pair of layers of elastomeric material; the improvement comprising the steps of:

a. providing an uncured hose having the aforesaid body construction on a solid mandrel extending through said uncured hose along at least almost the entire length of the latter;

b. tightly clamping said uncured hose at each of its opposite end regions by means of a respective clamping device engaging at least the outer surface of said uncured hose for inhibiting any entry of fluid pressure into the space between such proximate layers of elastomeric material along an intermediate layer of reinforcement material, said uncured hose over the entire expanse of said outer



surface thereof except at the clamped ends being free of any closely juxtaposed solid confinement structure;

c. immersing said uncured hose in a bath of liquid sufficient to cover said uncured hose substantially completely;

d. while said uncured hose remains immersed in said bath of liquid, subjecting said hose in a pressurized thermal environment to the direct action of fluid pressure against the outer hose surface, so that said pressure and the thermal expansion of said mandrel act on the outer and inner hose surfaces, respectively; and

e. maintaining said uncured hose in said pressurized thermal environment for a period of time sufficient to effect the vulcanization of said elastomeric material and the penetration thereof into said reinforcement material.

3,972,758

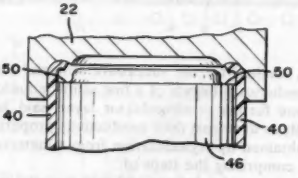
METHOD OF FORMING OVER A PLASTIC JACKET AGAINST A WORKPIECE USING VIBRATORY

James E. Bieber, Bethel, Conn., assignor to Branson Ultrasonics Corporation, New Canaan, Conn.

Filed June 17, 1975, Ser. No. 587,708

Int. Cl.² B32B 31/22, 31/20

U.S. Cl. 156—73.1 **6 Claims**



1. The method of forming over the edge of a thermoplastic cylindrical jacket against a workpiece comprising:

bringing the end of a suitably shaped horn adapted to be resonant at an ultrasonic frequency in contact with the upstanding edge of said jacket under a predetermined engagement force;

rendering said horn resonant while in contact with said upstanding edge whereby to cause said edge responsive to said force and contact with said horn rendered resonant to yield and be formed over for retaining the workpiece, and

reducing said engagement force from its predetermined value to a lower value responsive to the decreasing height of the upstanding edge.

3,972,759

BATTERY SEPARATORS MADE FROM POLYMERIC FIBERS

Robert R. Buntin, Baytown, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 267,325, June 29, 1972, Pat. No. 3,811,957, which is a continuation-in-part of Ser. No. 843,839, July 22, 1969, abandoned, which is a continuation-in-part of Ser. No. 787,258, Dec. 26, 1968, abandoned. This application June 11, 1973, Ser. No. 368,769
The portion of the term of this patent subsequent to May 21, 1991, has been disclaimed.
Int. Cl.² D04H 3/16; H01M 2/16
U.S. Cl. 156—167 3 Claims

1. In a process for producing a melt-blown non-woven mat battery separator wherein a fiber-forming thermoplastic polymer resin is extruded in molten form from orifices of a heated nozzle into a stream of hot inert gas which attenuates said molten resin into fibers that form a fiber stream, and said fibers are collected on a receiver in the path of said fiber stream to form the non-woven mat, the improvement of:

a. producing said mat at high resin flow rates, which comprises extruding from said nozzle orifices, at a resin flow rate of at least about 0.1 grams per minute per orifice, a fiber-forming thermoplastic polymer resin degraded to have both an intrinsic viscosity of from about 0.6 to less than 1.4 and an apparent viscosity in said nozzle orifices of from about 50 to about 300 poise;

b. collecting said fibers on said receiver in a basis weight of 100 – 400 grams/in.²;

c. compacting said fibers to a mat thickness of 10 to 50 mils and a porosity (percent void fraction) greater than 40 percent at a temperature about 5° to 20°F. above the softening point of said thermoplastic and 5° to 35°F below the melting point of said thermoplastics utilizing fixed spacers or shims at

i. a pressure of about 1–10 psi, and

ii. a time interval of from 0.01 to 30 seconds wherein said spacers or shims prevent large pressures from being applied directly to the mat surfaces, and

d. producing a battery separator having an electrical resistance less than 0.040 ohms/in².

3,972,760

METHOD OF MAKING A FISHING LURE COMPONENT

Margie F. Duescher, St. Paul, Minn., assignor to FisHair Incorporated, St. Paul, Minn.

Division of Ser. No. 194,933, Nov. 2, 1971, Pat. No. 3,864,864. This application Sept. 19, 1974, Ser. No. 507,402
Int. Cl.² D04H 3/14
U.S. Cl. 156—181 3 Claims

1. A method of making an article of commerce, such as a fishing lure component, comprising:

a. arranging a tow of heat-fusible hair-like fiber in a substantially flat planar manner;

b. by means of a heated bar applied transversely to one side of the tow, simultaneously clamping and fusing only the hairs of the tow of fiber together to form a bond comprising narrow planar common bond portions extending transversely to the tow and lying in the plane of the tow, said fiber being of such material as to render said bond portions brittle when cooled, said bond portions being formed in said tow at longitudinally spaced intervals, the bar forming a transverse line of reduced thickness between said common bond portions across the tow whereby each transverse bond splits lengthwise of the bond to separate successive increments of said tow bonded at both ends; and

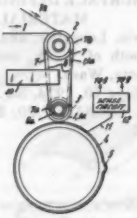
c. thereafter, mechanically cutting each such increment in two transversely to the length of the hairs between two bond portions to form articles having hairs bonded together at only one end.

3,972,761

WRAPPING OF PIPES OR TUBES

Helmut Landgraf, Rumeln-Kaldenhausen, and Walter Quitmann, Angermund, both of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Feb. 3, 1975, Ser. No. 546,352
Claims priority, application Germany, Feb. 12, 1974, 2407427
Int. Cl.² B65H 81/02
U.S. Cl. 156—187 11 Claims



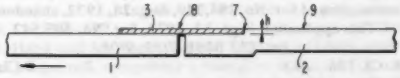
1. In a method of wrapping thermoplastic ribbon, tape or strip around a pipe or tube, which has a welding seam and rotates on its axis and advances axially so that the ribbon, tape or strip is wound helically onto the pipe or tube and wherein the speed of payout of the ribbon, tape or strip is slower than the tangential speed of the surface of the rotating tube or pipe thereby stretching the ribbon, tape or strip just ahead of winding, the improvement of temporarily relieving the stretching for a period which is short relative to the period of one revolution of the pipe for locally increasing the thickness of the ribbon, tape or strip as wound on the tube or pipe for covering an axial portion of the seam with a thickened tape; and periodically repeating the temporary relief at the rate of rotation of the pipe or tube to obtain an axially extending region of thicker thickness of an envelope as resulting from said winding.

3,972,762

COATING METHOD

Sei Kawahara; Akira Takagi, and Hirosi Nozawa, all of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minamiashigara, Japan

Filed Sept. 3, 1974, Ser. No. 502,337
Claims priority, application Japan, Sept. 3, 1973, 48-99069
Int. Cl.² B29C 19/00
U.S. Cl. 156—196 8 Claims



1. A method of liquid coating a web having surface discontinuity on the side being liquid coated, said method including the steps of:

moving said web longitudinally through a coating station,
applying said liquid to the face of said web bearing said discontinuity,
the improvement comprising:
varying the thickness of the portion of the moving web immediately downstream of said surface discontinuity prior to movement of the web through said coating station to provide a height to said web portion facing said liquid coating which is not less than the height of said surface discontinuity, to prevent coating thickness irregularities by the presence of said discontinuity.

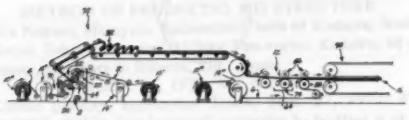
3. The method of claim 2, wherein said web comprises abutting web portions, said discontinuity comprises a splicing tape fixed to the surface of the web portions being coated and connecting the same and wherein the step of varying the thickness of said web portion immediately downstream of said surface discontinuity comprises reducing the thickness of that downstream web portion to which said splicing tape is mounted to the extent of the thickness of said splicing tape.

3,972,763

METHOD OF LAMINATING PLANAR AND CORRUGATED SURFACE DEFINING LAYERS OF SHEET MATERIAL

Arthur Dale Wolvin, Longview, and Richard Milton Morris, Jr., Bellevue, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed June 10, 1974, Ser. No. 477,845
Int. Cl.² B31F *1/20*; B32B *3/28*
U.S. Cl. 156—210 **14 Claims**



1. A method of laminating two or more layers of sheet material, one of which has a corrugated surface thereon and the other of which has a planar surface thereon, comprising passing the corrugated surface defining layer about a carrier roll, generating a pressure differential across the carrier roll to retain the corrugated surface defining layer thereon, rotating the carrier roll in juxtaposition to a series of spaced parallel lines of adhesive that are disposed crosswise of the ridges of the corrugated surface defining layer and contacted with the ridges so as to deposit series of spaced, pressure deformable spots of adhesive along the lengths of the ridges of said layer, and thereafter contacting the planar surface of the other layer with the series of spots on the ridges of the corrugated surface defining layer, pressing the two layers together so that they splay the respective spots into the spaces therebetween and form substantially continuous lines of adhesive along the lengths of the ridges, and bonding the two layers together at the lines of adhesive on the ridges, including at points on the planar surface of the other layer coinciding with the spaces between the spots.

3,972,764

PLASTIC BOOK COVER AND METHOD OF MAKING

Mortimer S. Sendor, Queens Village, N.Y., assignor to Bookwrights, Inc., Scarsdale, N.Y.

Continuation of Ser. No. 284,349, Aug. 28, 1972, abandoned.
This application Sept. 13, 1974, Ser. No. 505,542
Int. Cl.² B29D *7/02*, *9/08*
U.S. Cl. 156—243 **3 Claims**

1. The method of making a line of successive covers, which method comprises applying a first layer of semi-liquid plastic material, of continuous surface both lengthwise and widthwise, to a continuously travelling casting surface with the layer as wide as the combined widths of front and back panel areas and a connecting spine panel area of successive book covers that are to be made by the method, then applying a second layer of plastic locally to areas of the first layer which will be front and back panels of the book covers, the second layer being applied by passing the first layer under a coating roller that has recessed grooves in its circumference, supplying to one of the recessed grooves additional semi-liquid plastic material, for the second layer, of a width that coats the first layer and makes the front panels of the successive covers, supplying to another of the recessed grooves additional semi-

liquid plastic material, for the second layer, of a width that coats the first layer and makes the back panels of the successive covers, whereby the application of said semi-liquid plastic materials to the first layer makes the front and back panels of the covers thicker and stiffer than other areas of the finished cover, and limiting the thickness of the plastic covers at hinge lines of the covers by maintaining, over the hinge line areas, uncoated circumferential surfaces of the roller that are of greater radius than the circumferential surfaces of the roller grooves.

3,972,765

METHOD OF MAKING LAMINATE SHEETS FOR PRINTED CIRCUIT BOARDS

Terutake Kondō, and Syunya Yokozawa, both of Shimodate, Japan, assignors to Kitachi Chemical Company, Ltd., Tokyo, Japan

Filed Mar. 5, 1974, Ser. No. 448,236
Claims priority, application Japan, Mar. 5, 1973, 48-25073
Int. Cl.² C09J *5/04*
U.S. Cl. 156—315 **6 Claims**

1. In a method of making an epoxy-glass laminate sheet comprising a nonwoven fabric of glass fiber as a substrate, which comprises the steps of impregnating a nonwoven fabric of glass fiber with an epoxy resin, drying the resulting fabric of glass fiber to form a prepreg, laminating a predetermined number of so formed prepregs, and then pressing, while heating, the laminate to obtain an epoxy-glass laminate sheet for production of a printed circuit board, the improvement wherein the nonwoven fabric of glass fibers is treated with a liquid mixture containing a silane coupler and a water-soluble phenol resin prior to the step of impregnating the nonwoven fabric with the epoxy resin.

3,972,766

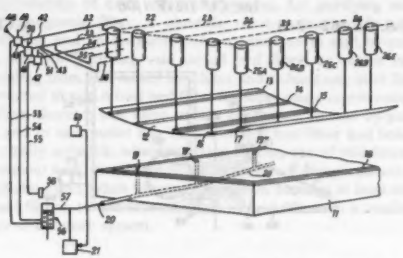
APPARATUS FOR FABRICATING FLAT OBJECTS

André Fontvieille, 20, Place Turenne, 59240 Dunkerque, France

Filed Jan. 17, 1975, Ser. No. 542,081
Int. Cl.² B30B *15/16*
U.S. Cl. 156—358 **5 Claims**

1. A press for fabricating laminated panels having at least one layer of plastic material to be heat treated comprising,
a rigid lower plate and an upper plate flexible along a direction of the generatrices,
rows of jacks disposed parallel to the generatrix direction to force the flexible plate downwards into a planar form or a flexed form,
means disposed at the peripheries of the plates to form a seal between them when sufficiently close together,

means for producing a vacuum between the plates,
means for connecting said vacuum means to said rows of jacks,



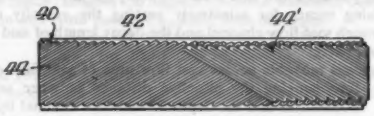
means through said connecting means for regulating the lowering of said rows of jacks as a function of the lowering of the pressure between the plates.

3,972,767

APPARATUS FOR FORMING A TIRE BREAKER

Larry C. Frazier, Sun City, Ariz., assignor to National-Standard Company, Niles, Mich.

Filed Feb. 13, 1975, Ser. No. 549,849
Int. Cl.² B29H *17/28*
U.S. Cl. 156—397 **17 Claims**



1. Apparatus for forming a tire breaker from a cord on a gum base comprising a work belt supporting the gum base, a rotor member mounted on frame means for rotation above said work belt on an axis perpendicular to said work belt adjacent one side thereto, means for rotating said rotor member in increments of about 180°, a pair of diametrically opposed outer cord engaging and laying means carried by said rotor member on opposite sides of said axis, an inner cord engaging and laying means mounted on said frame means adjacent said axis, said cord engaging said inner cord engaging and laying means and wrapping around it to form a portion of one edge of said tire breaker during successive increments of rotation of said rotor member, said outer cord engaging and laying means during successive increments of rotation of said rotor member alternately engaging the cord and folding the same into successive side-by-side loops to form portions of the other edge of said tire breaker and said inner and outer cord engaging and laying means laying each folded portion of the cord on the gum base at the termination of each increment of rotation of said rotor member.

3,972,768

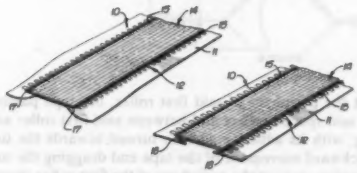
CARPET SEAMING TAPE, ELECTRIC IRON THEREFOR

Harvey J. Hill, Monterey Park, Calif., assignor to Roberts Consolidated Industries, Inc., City of Industry, Calif.

Filed July 8, 1974, Ser. No. 486,422
Int. Cl.² B32B *3/02, 3/04;* **C09D** *7/04;* **D06F** *75/38*
U.S. Cl. 156—545 **10 Claims**

1. In an electric iron for heating a hot-melt carpet seaming tape having longitudinal guide edges along each side thereof, the combination of:
an elongated, generally rectangular sole plate having leading and trailing ends;
and parallel plate edges,
said plate having a flange-defined guide groove therein adjacent to each of said plate edges inwardly of said edges at the leading end of said plate and generally parallel to the bottom surface of said plate, each of said guide grooves comprising a horizontally inwardly facing channel and each being adapted to receive one of the guide edges of such a seaming tape so as to center the tape relative to the iron and maintain the tape centered relative to the iron as the iron is moved longitudinally along the tape; and
electrical heating means associated with said sole plate for heating it, to melt an adhesive on such tape.

6. In a carpet seaming tape, the combination of:
a barrier layer of thin and limp continuous tape having substantially parallel outer edges;
an adhesive layer of hot-melt adhesive on and secured to said barrier layer,
said adhesive layer having parallel outer edges spaced inwardly from the outer edges of said barrier layer and generally parallel thereto,



each of said outer edge portions of said adhesive layer overlying the barrier layer but being free of securement thereto to form a guide strip portion along each outer edge of said adhesive layer,
said adhesive layer being longitudinally flexible but providing resistance to transverse compression.

10. In a carpet seaming tape, the combination of:
a barrier layer of thin and limp continuous tape having substantially parallel outer edges;
an adhesive layer of hot-melt adhesive on and secured to said barrier layer,
said adhesive layer having parallel outer edges spaced inwardly from the outer edges of said barrier layer and generally parallel thereto,
each of the outer edge portions of said barrier layer adjacent to an outer edge of said adhesive layer is folded back upon itself a first time under the adjacent outer edge of said adhesive layer to form a folded back portion and is folded a second time in the reverse direction to form guide strips along each outer edge of said adhesive layer,
said adhesive layer being longitudinally flexible but providing resistance to transverse compression.

3,972,769

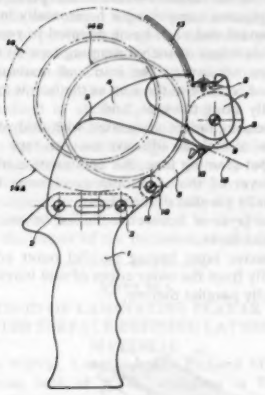
TOOL FOR DISTRIBUTING ADHESIVE TAPE

Adelio Lissoni, Vedano Olona (Varese), Italy, assignor to S.I.-.A.T. - Societa' Internazionale Applicazioni Tecniche S.p.A., Milan, Italy

Filed May 3, 1974, Ser. No. 466,854
Claims priority, application Italy, May 3, 1973, 21355/73
Int. Cl.² B32B *31/00*
U.S. Cl. 156—577 **3 Claims**

1. Hand tool for dispensing and applying adhesive tape fed from a tape roll, comprising a handgrip; at least a first and a second support plate parallel to and spaced from each other and fixed to the handgrip; a first and a second roller, means mounting said rollers freely rotatably about their respective axes with said axes being in parallel, spaced relation on and

between said support plates, said rollers comprising the sole means for supporting the tape roll with the periphery of the tape roll bearing against said rollers, the first of said rollers forming also means for applying the tape; means for retaining the free end of the tape, in the form of a tongue that oscillates



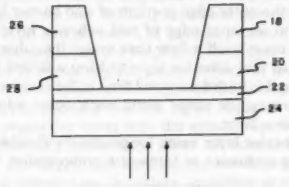
against the periphery of said first roller, the tape passing between said spaced rollers and between said first roller and the tongue, with its adhesive surface turned towards the tongue, the backward movement of the tape end dragging the tongue, by adhesion, against the periphery of the first roller thereby to retain the tape roll between said plates.

3,972,770

METHOD OF PREPARATION OF ELECTRON EMISSIVE MATERIALS

William W. Stein, Beaverton, Oreg., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Continuation of Ser. No. 381,962, July 23, 1973, abandoned.
This application Mar. 21, 1975, Ser. No. 560,916
Int. Cl.[2] H01L *21/20*
U.S. Cl. 156—600 8 Claims



1. A method of making a radiation sensitive electron emissive semiconductor device comprising:

forming a first relatively thin epitaxial layer of GaAlAs onto a relatively thick substrate layer of GaAs, said first layer being thinner than said substrate,

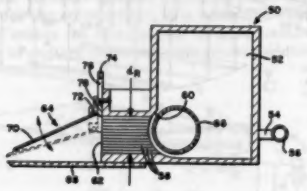
forming a second thin monocrystalline epitaxial layer of GaAs onto said first epitaxial layer, said second layer being thinner than said first and substrate layers and sufficiently thin to be capable of emitting electrons within a vacuum upon excitation by radiation, and etching away a central portion of said substrate layer with an etchant which preferentially etches GaAs but does not etch GaAlAs to expose a surface of said GaAlAs layer and to leave a peripheral supporting rim of said GaAs substrate layer.

3,972,771

HEADBOX WITH VARIABLE EDDY DECAY LENGTH

Willard C. Notbohm, Watertown, N.Y., assignor to The Black Clawson Company, Middletown, Ohio

Filed Feb. 28, 1974, Ser. No. 446,660
Int. Cl.[2] D21F *1/06*
U.S. Cl. 162—343 6 Claims



1. In a headbox comprising opposed slice blades defining a slice chamber having at the downstream end thereof a slice opening of variable area for feeding paper making stock to a forming member, paper making stock supplying means, a flow channel having an upstream end receiving paper making stock from said paper making stock supply means and a downstream end discharging said paper making stock into said slice chamber, said flow channel having a flow area defined by first, relatively long, opposed boundaries extending in the cross machine direction of said headbox and constituting the width of said flow channel and second, relatively short, opposed boundaries extending between said first opposed boundaries and defining the depth of said flow channel, and means subdividing said flow channel into a plurality of passages to create a corresponding plurality of eddies as the stock passes from said passages into said slice chamber, the improvement comprising means for selectively varying the velocity of flow through said flow channel and the decay length of said eddies, comprising:

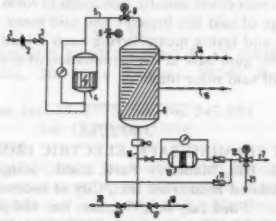
means movable across said flow area of said flow channel for changing the effective distance between said first boundaries and the depth of said flow channel by blocking or uncovering portions of said flow channel progressively along a line parallel to said first boundaries.

3,972,772

STEAM POWER PLANT FOR NUCLEAR REACTOR STATIONS HAVING PRESSURIZED WATER REACTORS

Hans-Gunter Heitmann, Erlangen-Buckenhof, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Continuation of Ser. No. 273,192, July 19, 1972, abandoned.
This application May 21, 1974, Ser. No. 471,844
Claims priority, application Germany, July 20, 1971, 2136185
Int. Cl.[2] G21C *19/30*
U.S. Cl. 176—37 2 Claims



1. Filter system for the purification of blowdown water in steam power plants having nuclear reactors, comprising a blowdown water line, an electromagnetic filter having an inlet

connected to said blowdown water line and having an outlet line, a mixed bed filter for ionogenic impurities connected to said outlet line of said electromagnetic filter, a by-pass line disposed in parallel with said mixed bed filter, means for purifying said electromagnetic filter and said mixed bed filter independently of each other comprising, for purifying said electromagnetic filter, a closable valve connected in said outlet line and an openable valve connected in said by-pass line and, for purifying said mixed bed filter, an outlet line extending from said mixed bed filter and at least one inlet line connected to said mixed bed filter for supplying a regenerating medium thereto, and valve means connected to said by-pass line and to said outlet line of said mixed bed filter and being selectively actuable, when purifying at least one of said filters, to connect said one of said filters to a waste water preparation installation and, when filtering blowdown water in at least one of said filters, to connect said one of said filters to a cooling water circulatory system.

3,972,773

PROCESS FOR PRODUCING PEPTIDE

Yoshikazu Isowa, Tokyo; Takeshi Nagasawa, Koriyama; Katsumasa Kuroiwa, Koriyama, and Koichi Narita, Koriyama, all of Japan, assignors to Sagami Chemical Research Center, Tokyo and Nitto Boseki Co., Ltd., both of, Japan

Filed Apr. 29, 1975, Ser. No. 572,630
Int. Cl.² C12D *13/06*
U.S. Cl. 195—29 **9 Claims**

1. A process for producing a peptide having the formula:

X-A-B-C-Y

wherein

A represents Ala., Gln., Asn, ω-BOC-Lys., Leu., Gly., Glu.,

Glu, Pro;

OMe

or

A represents A_1 — A_2, wherein A_1 represents a hydrophilic amino acid residue and A_2 represents Val., Met., Leu. or Gln.;

B represents Phe., Tyr., Leu., Met., Glu., Asp., Gln., Asn or Trp.;

C represents Phe., Leu., Ileu., Tyr., Cys-SBzl., Ser-OBzl., Trp. or Met.;

X represents an α-amino acid protective group, an amino acid residue having an N-terminal protective group or a peptide residue having an N-terminal protective group;

Y represents a carboxyl protective group, an amino acid residue having a C-terminal protective group or a peptide residue having a C-terminal protective group, which comprises reacting a peptide having the formula:

X-A-B-OH

with an amino acid or peptide having the formula:

H-C-Y

neither of which reactants need be activated, in the presence of enzyme pepsin employing a pH of from 2 to 6 and a temperature of 20° – 50°C.

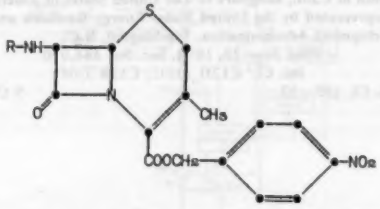
3,972,774

ENZYMATIC DE-ESTERIFICATION OF CEPHALOSPORIN PARA-NITROBENZYL ESTERS

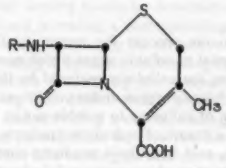
Donald Ray Brannon, Pittsboro, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed July 28, 1975, Ser. No. 599,510
Int. Cl.² C12C *9/04*
U.S. Cl. 195—29 **23 Claims**

1. A process for removing the p-nitrobenzyl group from a cephalosporin ester of the formula



to provide a cephalosporin acid of the formula



wherein R is hydrogen, 1,4-cyclohexadienylacetyl, mandeloyl, 4-aminophenylacetyl, 4-chlorophenylacetyl, 4-hydroxyphenylacetyl, phenylacetyl, 4-aminophenoxyacetyl, 4-chlorophenoxyacetyl, 4-hydroxyphenoacyacetyl, phenoxyacetyl, 4-aminophenylglycyl, 4-chlorophenylglycyl, 4-hydroxyphenylglycyl, phenylglycyl, 1-tetrazoleacetyl, 2-thiopheneacetyl, 3-thiopheneacetyl, or the hydrobromide, hydrochloride, nitrate sulfate or tosylate salt thereof when R is hydrogen, phenylglycyl, 4-aminophenylglycyl, 4-chlorophenylglycyl, or 4-hydroxyphenylglycyl; which comprises reacting said ester in an aqueous medium at 25° to 40°C. with an esterase enzyme produced by a microorganism selected from the group consisting of

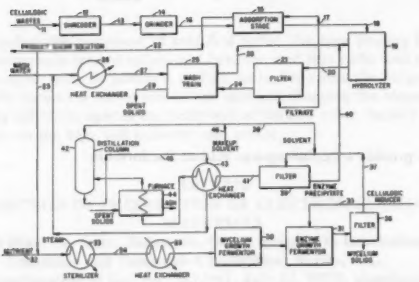
Bacillus cereus, *Bacillus circulons*, *Bacillus licheniformis* ATCC 7072 or *Bacillus subtilis*, and recovering said cephalosporin acid.

3,972,775

CONVERSION OF CELLULOSIC MATERIALS TO SUGAR

Charles R. Wilke, El Cerrito, and Gautam Mitra, Berkeley, both of Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 28, 1974, Ser. No. 484,010
Int. Cl.[2] C12D *13/02*; C12B *3/08*
U.S. Cl. 195—33 9 Claims



1. A continuous process for enzymatically converting a cellulosic material to soluble sugar which comprises:

a. hydrolyzing the cellulosic material by the degrading action of cellulase enzyme under conditions which promote conversion of cellulose to soluble sugar;

b. removing a stream of hydrolysis products from the hydrolysis stage, said hydrolysis products comprising a liquid sugar-containing phase and a solid phase containing unhydrolyzed spent solids, both of said phases containing cellulase enzyme from the hydrolysis stage;

c. adding a stream of fresh cellulosic material to the hydrolysis stage to replenish the cellulosic material converted to hydrolysis products;

d. contacting the liquid sugar-containing phase from step (b) with the added fresh cellulosic material prior to the introduction thereof to the hydrolysis stage, thereby recovering the cellulase enzyme contained in the liquid sugar-containing phase by adsorption on fresh cellulosic material;

e. recovering a stream of product sugar solution from step (d);

f. washing the solid phase containing unhydrolyzed spent solids from step (b) with a stream of water, thereby recovering cellulase adsorbed on said solids by solution in water;

g. adding the water containing recovered cellulase enzyme from step (f) to the hydrolysis stage; and

h. providing a stream of makeup cellulase enzyme for the hydrolysis stage by the steps including:

1. in a first zone, growing a cellulase-synthesizing microorganism on a minor portion of the product sugar solution, and

2. in a second zone, contacting the microorganism-containing medium with an amount of cellulosic material sufficient to induce formation of cellulase enzyme under conditions substantially non-supportive of growth of the cellulase-secreting microorganism.

3,972,776

PREPARATION OF PROTEIN MEMBRANES CONTAINING MICROBIAL CELLS

Wolf R. Vieth, Belle Mead; Shaw S. Wang, Somerset, and Rakesh Saini, New Brunswick, all of N.J., assignors to Research Corporation, New York, N.Y.

Filed Feb. 26, 1973, Ser. No. 336,009
Int. Cl.[2] C07G *7/02*; C12K *1/00*
U.S. Cl. 195—65 6 Claims

1. A process for producing an enzymatically active membrane, which comprises the steps of:

dispersing whole microbial cells in an inert solvent medium such that said dispersion contains from 0.5% to 10% by weight whole microbial cells;

heating said dispersion of whole microbial cells at a temperature of 80° to 90°C for at least 10 minutes to destroy the protoelytic activity of said cells;

dispersing a protein selected from the group consisting of collagen, zein, casein, ovalbumin, wheat gluten, fibrinogen, myosin and mucoprotein, or a polypeptide selected from the group consisting of polyglutamate, polyaspartate, polyphenylalanine, polytyrosine and a copolymer of leucine and p-aminophenylalanine in an inert solvent medium such that said dispersion contains from 0.1% to 5% by weight protein or polypeptide;

adjusting the pH of said dispersion of a protein or a polypeptide to a pH of from 2–12 such that a net electrical charge exists between said protein or polypeptide and said whole microbial cells when said whole cell dispersion and said polypeptide or protein dispersion are combined;

mixing said dispersions of whole microbial cells and protein or polypeptide;

casting said mixed dispersions into a membrane; and

drying said membrane, whereby bonding occurs between said cells and polypeptide or protein by the accumulative effect of multiple hydrogen bonds, salt linkages and van der Walls interactions, wherein the bonding forces effect immobilization of said whole microbial cells to the protein or polypeptide of said membrane.

3,972,777

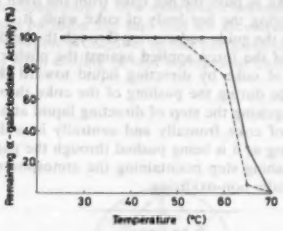
METHOD FOR RECOVERY OF REFINED α-GALACTOSIDASE

Masaru Yamada, Kitami; Tsutomu Furuya, Tokyo; Chikashi Izumi, Kitami; Shigeyoshi Narita, Kitami, and Hiroshi Ishikawa, Kitami, all of Japan, assignors to Hokkaido Sugar Co., Ltd., Tokyo, Japan

Filed Apr. 30, 1975, Ser. No. 572,944
Claims priority, application Japan, May 2, 1974, 49-48747
Int. Cl.[2] C07G *7/028*
U.S. Cl. 195—66 R 6 Claims

1. A method for recovering refined α-galactosidase from a liquid which is an extract of α-galactosidase containing microorganic cells or is an α-galactosidase culture broth, the liquid being in admixture with the cell material of the α-galactosidase producing microorganism, which consists essentially in the steps of filtration to remove the microorganic cell material, pH adjustment and precipitate removal, followed by the steps of bringing the resulting α-galactosidase-containing liquid into contact with a weakly acidic cation-exchange resin in the presence of a buffer solution (A) thereby causing the α-galactosidase in said liquid to be adsorbed by said resin,

desorbing the adsorbed α-galactosidase from the resin by use of a buffer solution, (B), of which at least one of the factors, concentration and pH value, is higher than that of the buffer



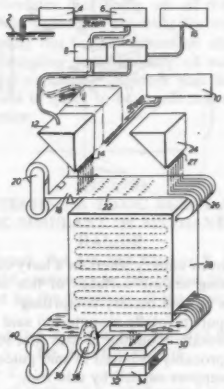
solution (A) used in said adsorption, and recovering the desorbed α-galactosidase in the liquid discharged from said resin.

3,972,778

APPARATUS FOR DETERMINING THE CONCENTRATION OF MICROORGANISMS

William Eric Cunningham, Ottawa, Canada

Filed Nov. 8, 1973, Ser. No. 413,929
Claims priority, application Canada, Nov. 17, 1972, 156789
Int. Cl.² C12K *1/04*
U.S. Cl. 195—139 **13 Claims**



1. Apparatus for determining the concentration of organisms in a sample of fluid comprising

an absorbent drop-receiving surface,

dropper means adapted to discharge single drops of said fluid onto said drop-receiving surface,

movable support means adapted to carry said absorbent drop-receiving surface beneath said dropper means, said support means being movable at such a rate as to insure that fluid drops discharged onto said drop-receiving surface remain separate one from the other,

photo-electric detector means positioned sufficiently downstream of said dropper means to detect any changes in light reflection or transmission characteristics of each separate drop as so caused by the presence of said organisms after exposure of said organisms to suitable incubation conditions, and

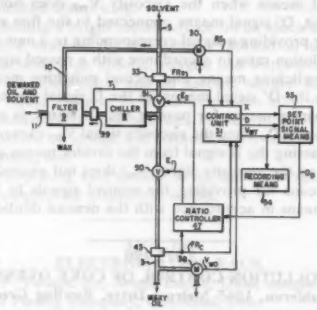
counter means connected with said detector means, said counter means registering the cumulative total of said separate drops in which any change of light reflection or transmission characteristics has been detected, thereby permitting the concentration of organisms within said fluid to be determined.

3,972,779

MEANS FOR CONTROLLING DEWAXING APPARATUS

Charles W. Harrison, Nederland, Tex., assignor to Texaco Inc., New York, N.Y.

Filed July 26, 1974, Ser. No. 492,362
Int. Cl.² B01D *11/04*; C10G *43/08*; G05B *21/02*, *24/02*
U.S. Cl. 196—14.5 **18 Claims**



1. A system for controlling dewaxing apparatus in which solvent is mixed with waxy oil at some ratio of solvent to waxy oil and the solvent-waxy oil mixture is chilled to some filtering temperature by chiller means to become a slurry mix which is provided to filtering means also receiving wash solvent at a predetermined flow rate and which provides a dewaxed oil and solvent mixture and wax, said control system comprising flow control means for controlling the flow rates of the waxy oil and the solvent to the chiller means so as to control the solvent-waxy oil ratio, flow rate sensing means for sensing the flow rates of the solvent and the waxy oil and providing signals corresponding thereto, reference signal means for providing reference signals corresponding to limits for the viscosity V_{mT} of the slurry mix leaving the chiller means at a filtering temperature, viscosity sensing means for determining the viscosity of the waxy oil and providing a corresponding signal, refractive index means for determining the refractive index RI of the solvent and providing a signal corresponding thereto, temperature sensing means for sensing the temperature T of the slurry mix leaving said chiller means prior to entering the filtering means and providing a corresponding signal, a dilution signal means connected to the flow rate sensing means for dividing the solvent flow rate signal with the waxy oil flow rate signal to provide an actual dilution signal D, X signal means connected to the dilution signal means for providing a signal corresponding to a factor X in accordance with the dilution signal D and the following equation:

$$X = D/(1+D),$$

X' signal means receiving the X factor signal for providing an X' signal corresponding to an increased value for X in accordance with the following equation:

$$X' = X + \Delta X,$$

X'' signal means receiving the X signal for providing a signal X'' corresponding to a decreased value for X in accordance with the following equation:

$$X'' = X - \Delta X,$$

slurry viscosity signal means connected to the X signal means, to the refractive index signal means, to the viscosity sensing

means and to the temperature sensing means for providing a signal corresponding to the viscosity V_{mT} of the slurry mix at the filtering temperature; comparing means receiving the reference signals and the V_{mT} signal for comparing the V_{mT} signal with the reference signals to provide at least two outputs corresponding to the comparisons, first switching means connected to the X′ signal means and to the X″ signal means and controlled by the outputs from the comparing means to pass the X″ signal when the viscosity signal V_{mT} exceeds the one reference signal and to pass the increased value X′ signal when the viscosity signal V_{mT} exceeds the other reference limit and to pass no signal from the X′ signal means and from the X″ signal means when the viscosity V_{mT} does not exceed either limit, D′ signal means connected to the first switching means for providing a signal corresponding to a new value D′ for the dilution ratio in accordance with a passed signal from the first switching means, and second switching means connected to the D′ signal means, to the D signal means and to the comparing means for passing the D′ signal as a desired dilution signal D_D when the viscosity signal V_{mT} exceeds a limit and for passing the D signal from the divider means as the D_D signal when the viscosity signal V_{mT} does not exceed a limit, circuit means for providing the control signals to the flow control means in accordance with the desired dilution signal D_D.

3,972,780

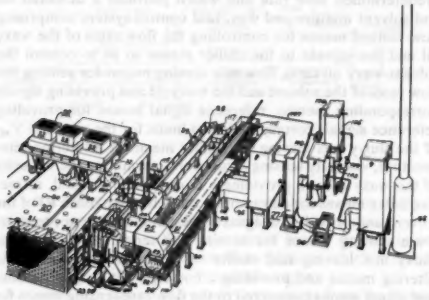
POLLUTION CONTROL OF COKE OVENS

Albert Calderon, 1065 Melrose Drive, Bowling Green, Ohio 43402

Continuation of Ser. No. 308,703, Nov. 22, 1972, abandoned, which is a continuation-in-part of Ser. No. 283,427, Aug. 24, 1972, abandoned. This application June 14, 1974, Ser. No. 479,461

Int. Cl.² C10B *57/12*

U.S. Cl. 201—39 **23 Claims**



1. Apparatus for making coke including a battery of ovens having adjacent pusher sides and adjacent coke discharge sides, a quenching chamber having an inlet portion adapted to be located adjacent the discharge side of any of said ovens, means for quenching the coke as it is being pushed into said quenching chamber, a traveling evacuator means adapted to move along said battery of ovens on their coke discharge sides and to be positioned adjacent the coke discharge side of a selected oven, said evacuator means being adapted to extract gases from the discharge side of any of said ovens during charging of that oven, said evacuating means also being adapted to extract gases from said chamber as the coke is quenched therein, a duct running along the length of said battery having an open top which is covered by a band in the form of a conveyor belt, a fixed connection between said duct and said evacuator, said band having drive means to move said band linearly in the same direction and at substantially the same speed as said traveling evacuator means, the linear motion of said band being dictated by the motion of said evacuator means.

6. A method of abating smoke during the pushing of coke from a coke oven having a pusher side and a coke discharge opening, said method comprising the steps of providing a guide having an inlet portion and an outlet portion, placing the inlet portion of said guide in alignment with the coke oven discharge opening, applying force against the pusher side of a hot body of coke to push the hot coke from the oven through said guide, cooling the hot body of coke while it is at least partially within the guide and moving through the guide under the influence of the force applied against the pusher side of the hot body of coke by directing liquid toward the coke within the guide during the pushing of the coke through the guide and comprising the step of directing liquid at a face of the hot body of coke frontally and centrally in a direction opposite pushing as it is being pushed through the guide, and during said pushing step maintaining the atmosphere of the guide substantially non-oxidizing.

3,972,781

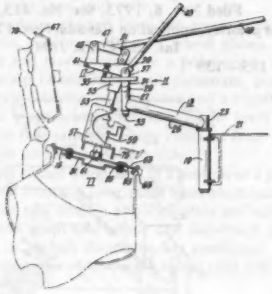
SCRAPER FOR THE LID AND LID SEAT OF A COKE OVEN ASCENSION PIPE

Emmanuel V. Gouye, Pittsburgh, and Gerald S. Radaci, Munhall, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Aug. 26, 1974, Ser. No. 500,532

Int. Cl.² B23D *79/06*; **C10B** *43/06*

U.S. Cl. 202—241 **14 Claims**



1. In a coke oven battery whereon a larry car travels, apparatus for cleaning seating surfaces of lids and openings of ascension pipes on said battery comprising:

a. a first support pivotally mounted to said larry car;
b. a guide pivotally mounted to said first support;
c. a rod reciprocably disposed in said guide;
d. a second support carried by said rod;
e. first and second means mounted to a rotatable mechanism mounted to said second support for coacting with and cleaning said seating surfaces;
f. third means for reciprocating said rod; and
g. fourth means for pivoting said guide and bringing said first and second means into position for coacting with said seating surfaces.

3,972,782

EMISSION CONTROL APPARATUS

James D. Patton, 9480 Olive Blvd., St. Louis, Mo. 63132

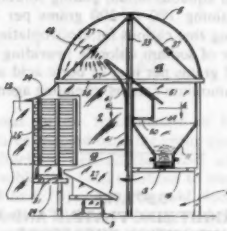
Filed Dec. 4, 1974, Ser. No. 529,288

Int. Cl.² C10B *27/04*

U.S. Cl. 202—263 **10 Claims**

1. Apparatus installed over the quenching car tracks on the coke side of a coke oven battery for controlling emissions caused by pushing of coke from a coke oven, said apparatus comprising a shed extending along the coke side of said battery having a laterally arched roof and supports for said roof, a longitudinal upright partition within said shed dividing the shed into an entrapment chamber adjacent said battery for containing the emission and an expansion chamber extending

parallel to and offset laterally from the entrapment chamber, said partition comprising a heat shield having one side facing the oven discharge doors and located across the quench car tracks from said doors, exhaust means for said entrapment chamber comprising a flow restriction defined by the upper end of said partition and said roof for accelerating gases leaving the entrapment chamber so that particulates are entrained, inhibited from settling in said entrapment chamber, and carried into said expansion chamber where gas velocity is reduced and particulates may settle out of the gas stream, a hopper below said expansion chamber for collection of the particulates settling out in said expansion chamber, and an exhaust duct extending longitudinally of said shed downstream from said expansion chamber and having openings therein for ingress of gases to be conducted away from said expansion chamber.



3,972,783
METHOD OF TESTING A TOXIC AGENT ALARM WITH A NONTOXIC SIMULANT OF METHANESULFONYL HALIDE

Edward J. Poziomek, Bel Air, and Eleanor V. Crabtree, Towson, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 8, 1974, Ser. No. 513,016
Int. Cl.² B01K *1/00*
U.S. Cl. 204—1 T 4 Claims

1. A method of testing; i.e., challenging a toxic G and V agent alarm for the detection of toxic G agents by using a simulant compound for said G agents which has no significant toxicity, said alarm including an electrochemical cell with a silver electrode for the detection of CN^- ions, said cell having an electrolyte including an oxime for reaction with phosphonofluoridates, G agents and analogues thereof, whereby CN^- ions are generated, said alarm further including $AgNO_3$ and KF for th conversion of V agents to G analogues, comprising the steps of providing an air sample containing said simulant compound having the formula

$$H_3C - SO_2X$$

wherein X is a halogen of the group consisting of chlorine and fluorine, passing said simulant compound to the electrochemical cell and reacting simulant compound with the electrolyte of the electrochemical cell of the alarm to produce CN^- ions in the cell electrolyte, reacting the CN^- ions at the silver electrode of the electrochemical cell to produce a change in potential, and monitoring the change in potential to determine the alarm challenge.

3,972,784
METHOD FOR PRETREATING SURFACES OF ELECTRICALLY CONDUCTIVE MATERIALS PRIOR TO ELECTROPLATING

Richard Dötzer, Nurnberg, and Georg Iwantscheff, Nurnberg-Laufamholz, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

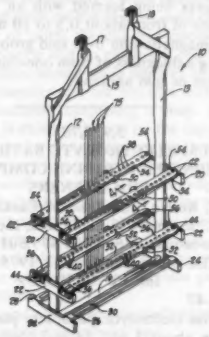
Filed Nov. 27, 1973, Ser. No. 419,233
Claims priority, application Germany, Dec. 8, 1972, 2260191
Int. Cl.² C25D *5/34, 5/24*
U.S. Cl. 204—14 N 6 Claims

1. A method comprising:
a. generating a bright metal surface on an electrically conductive material by mechanical fabrication under the protection of an aprotic, oxygen and water-free protective gas atmosphere and an aprotic, oxygen and water-free liquid medium to which aluminum alkyl or organo aluminum electrolyte has been added which prevents the formation of oxides and hydroxides by air, oxygen and moisture, and
b. electroplating said surface in an aprotic oxygenfree organo-aluminum electrolyte media.

3,972,785
ELECTROPLATING RACK

Stephen P. Palisin, Jr., South Euclid, Ohio, assignor to The Empire Plating Company, Cleveland, Ohio

Filed June 17, 1974, Ser. No. 479,617
Int. Cl.² C25D *17/08*
U.S. Cl. 204—297 W 10 Claims



1. An electroplating rack comprising:
a. an electrically conductive framework including a pair of spaced uprights;
b. an electrically conductive structure extending between and rigidly connecting said uprights near the lower ends thereof;
c. an electrically insulative material covering said framework and said structure except in a region on said structure where an exposed, substantially upwardly facing electrode surface is defined;
d. a pair of non-electrically conductive members removably carried by said framework at vertically spaced positions above said surface, said members being provided with a plurality of spaced formations for receiving and supporting a plurality of elongated first articles on end with portions of their lower ends in electrically conductive engagement with said surface; and,
e. at least one additional non-electrically conductive member adapted to be interchanged with selected of said pair of members and having a plurality of spaced formations of a different configuration than the formations of said selected of said pair of members, whereby when said

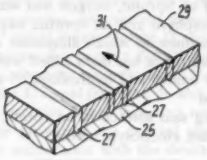
additional member is interchanged with said selected of said pair of members, the rack will receive and support a plurality of elongated second articles having configurations which differ from those of the first articles.

3,972,786

MECHANICALLY ENHANCED MAGNETIC MEMORY

Nathan Thomas Ballard, Santa Monica, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed June 28, 1974, Ser. No. 484,095
Int. Cl.² C25D 5/34, 3/56; G11C 11/02
U.S. Cl. 204—32 R 3 Claims



1. A process for making a magnetic memory structure wherein a magnetic film is electrodeposited on a non-magnetic metallic substrate comprising the steps of:

a. polishing said substrate, whereby grooves are formed in said substrate parallel to a desired easy axis of magnetization, said grooves occupying an area of 5 to 10 percent of said substrate,

b. said grooves being formed with an abrasive having a particle size of from about 0.3 to 10 microns, and

c. plating a magnetic film over said grooved substrate, said film having a thickness of from one-third to five times the particle size of said abrasive.

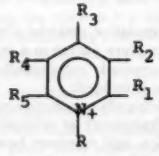
3,972,787

PALLADIUM ELECTROLYTE BATHS UTILIZING QUATERNIZED PYRIDINE COMPOUNDS AS BRIGHTENERS

Fred I. Nobel, Roslyn, and John McCaskie, North Merrick, both of N.Y., assignors to Lea-Ronal, Inc., Freeport, N.Y.

Continuation-in-part of Ser. No. 479,501, June 14, 1974, abandoned. This application June 13, 1975, Ser. No. 586,711
Int. Cl.² C25D 3/52
U.S. Cl. 204—47 14 Claims

1. An aqueous electrolytic palladium plating bath having a pH of between about 4 and 14 and containing a palladium compound capable of being electrolytically plated and a water soluble quarternized pyridinium brightening agent in an amount of about 0.001 g/l up to their solubility limit of about 10 g/l which in said bath provides a cation of the formula



in which R is a benzyl radical, a saturated or unsaturated straight, branched or cyclic C_1–C_6 aliphatic or hydroxyaliphatic radical or a polyalkylene oxide radical and R_1, R_2, R_3, R_4 and R_5 each is a hydrogen atom or a halogen atom or a lower alkyl, lower alkenyl, hydroxyl, carboxyl, amino, lower alkylol, lower alkylcarboxyl, lower alkylamine, lower alkylol amino group or a group resulting from the reaction of the hydroxyl, carboxyl, amino, lower alkylol, lower alkylcarboxyl or lower alkylamine group with an alkyl sultone, an alkyl lactone or an epoxide.

3,972,788

ZINC ANODE BENEFACTION

Frank Passal, Detroit, Mich., assignor to M & T Chemicals Inc., Greenwich, Conn.

Filed Jan. 6, 1975, Ser. No. 538,603
Int. Cl.² C25D 3/22
U.S. Cl. 204—55 R 2 Claims

1. An improved aqueous acidic plating solution for anode benefaction containing 100 to 200 grams per liter of zinc sulfamate providing zinc cations for electroplating zinc, 25 to 40 grams per liter of sodium chloride providing chloride anions and 20 to 35 grams per liter of boric acid as a buffer in the absence of ammonium cations, chelating agents, and complexing agents.

3,972,789

ALKALINE BRIGHT ZINC PLATING AND ADDITIVE COMPOSITION THEREFORE

Frederick W. Eppensteiner, Southfield, Mich., and Phillip J. DeChristopher, Chicago, Ill., assignors to The Richardson Company, Des Plaines, Ill.

Filed Feb. 10, 1975, Ser. No. 548,242
Int. Cl.² C25D 3/22, 3/24; C08G 65/26
U.S. Cl. 204—55 Y 28 Claims

1. A bright zinc, electroplating bath comprising an aqueous alkaline solution containing a source of zinc ions and from about 0.001 to about 1.0 grams per liter of a composition selected from the group consisting of a condensate of a heterocyclic compound and an epihalohydrin and the quaternary salt of such condensate wherein the mol ratio of heterocyclic compound to epihalohydrin ranges from about 2:1 to 1:2, said condensate having a molecular weight of from about 400 to 9000, said heterocyclic compound being a pyridine substituted in the 3 or 4 position with a radical selected from the group consisting of carbamoyl and acylhydrazino.

28. An aqueous concentrate for preparing the bath of claim 1 containing a composition selected from the group consisting of a condensate of a heterocyclic compound and a epihalohydrin and the quaternary salt of such condensate wherein the mol ratio of heterocyclic compound to epihalohydrin ranges from about 2:1 to 1:2, said condensate having a molecular weight of from about 400 to 9000, said heterocyclic compound being a pyridine substituted in the 3 or 4 position with a radical selected from the group consisting of carbamoyl and acylhydrazino.

3,972,790

PRODUCTION OF METALLIC LEAD

John C. Stauter, Itasca, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sept. 26, 1975, Ser. No. 616,983
Int. Cl.² C25C 1/18
U.S. Cl. 204—117 5 Claims

1. A process for the production of metallic lead which comprises the steps of:

1. treating a lead sulfide feed stock with a fluorinating agent,
2. dissolving the resultant lead fluoride in hydrofluosilicic acid,
3. separating the solid residue,
4. subjecting the clarified acid leach solution to electrolysis, and
5. recovering the resultant metallic lead.

3,972,791
FRACTIONATION OF PROTEINS BY ELECTRICAL MEANS

Harold Stern, Llewellyn Park, West Orange, N.J. 07052

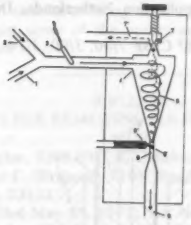
Filed May 6, 1974, Ser. No. 467,115
Int. Cl.² B01K 5/00
U.S. Cl. 204—180 P 20 Claims

1. A process for the fractionation of liquid solutions of protein mixtures selected from the group consisting of plasma, serum and fractions derived therefrom which includes the steps of (a) subjecting such solutions to electrodialysis in the pH range 4.8 to 6; (b) conducting said electrodialysis at temperatures below 15°C; (c) continuing said electrodialysis until the specific resistance of the resultant mixture exceeds 1000 ohm-cm and a fraction of said protein mixture precipitates; (d) separating the precipitate from the supernatant soluble protein solution; and (e) recovering said supernatant soluble protein solution.

3,972,792
DEVICE FOR DETERMINATION OF CHEMICALS IN A SAMPLE FLOW

Toroff Tom Paul Laxen, Helsinki, Finland, assignor to Oy Keskuslaboratorio-Centrallaboratorium AB, Tapiola, Finland

Filed Apr. 8, 1974, Ser. No. 458,790
Claims priority, application Finland, Apr. 17, 1973, 1234/73
Int. Cl.² G01N 27/46
U.S. Cl. 204—195 R 4 Claims

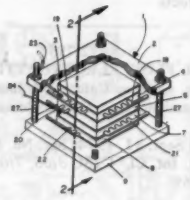


1. Apparatus for the determination of concentrations of chemicals by means of a voltametric method in a sample flow including in combination a hollow conical chamber having an upper large diameter portion and a lower small diameter portion, entrance conduit means communicating with said large diameter portion to introduce a sample flow into the upper portion of said conical chamber in a generally tangential direction where it travels in a generally spiraling path to said lower small diameter portion, a first exit conduit axially connected to said small diameter portion of said conical chamber, outside and below the conical chamber, to exit a heavier portion of said sample flow from said conical chamber, a second exit conduit axially connected to said large diameter portion of said conical chamber, above the conical chamber, to exit a lighter portion of said sample flow from said conical chamber and first and second spaced measurement electrodes positioned inside said first exit conduit immediately adjacent said small diameter portion of said conical chamber.

3,972,793
CONTINUOUS FLOW-THROUGH MERCURY CATHODE ELECTROLYSIS CELL

David A. Hall, Indianapolis; Donnis M. Berry, Greenwood, and Paul W. Landis, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sept. 26, 1975, Ser. No. 616,988
Int. Cl.² C21D 21/10
U.S. Cl. 204—219 6 Claims



1. A continuous flow-through mercury cathode electrolysis cell comprising:

a. a first chamber comprising a wide shallow cavity closed on the top and open on the bottom, said chamber having an inlet port or ports thereto and oppositely disposed outlet port or ports and an electrode disposed therein;

b. a non-conductive porous plate adapted to be the bottom of said first chamber and the top of a second chamber;

c. a second chamber comprising a wide shallow cavity closed on the bottom and open on the top, said chamber having one or more inlet ports opening thereinto near the top thereof at an acute angle to the side thereof and an outlet port therefrom comprising a standpipe extending upwardly from the bottom of said cavity to a point near the top and substantially in the center thereof;

d. means for axially disposing said first and second chambers in a vertical orientation in a fluid tight assembly, the first above the second with said porous plate separating the two chambers;

e. a first and second electrode disposed respectively in said first and said second chambers; and

f. a mercury pool disposed in the bottom of said second chamber, said mercury pool completely covering said electrode.

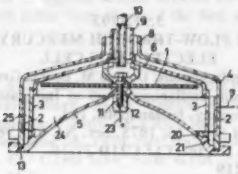
3,972,794
ELECTROLYTIC CELL

August Uno Lamm, 365 Moseley Road, Hillsborough, Calif. 94010

Filed Sept. 20, 1974, Ser. No. 507,980
Claims priority, application Australia, Sept. 26, 1973, 60759/73
Int. Cl.² C25B 1/26, 9/00
U.S. Cl. 204—266 13 Claims

1. An electrolytic cell for oxidizing chloride ions to generate chlorine gas, comprising a housing having an anode chamber and a cathode chamber disposed side by side, a substantially vertical semi-permeable non-conductive diaphragm through which the anode and cathode chambers communicate with each other, an anode and a cathode disposed respectively in the anode and the cathode chamber, said anode being vertically spaced from the diaphragm and horizontally spaced from

the cathode, a brine inlet and a chlorine gas outlet in communication with the anode chamber, and an outlet in communi-



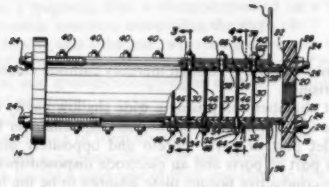
cation with the cathode chamber for discharging cathodic electrolysis products.

3,972,795

AXIAL FLOW ELECTROLYTIC CELL

Duane N. Goens, Golden, Colo., and James L. Lake, Lakewood, Ohio, assignors to Hazen Research, Inc., Golden, Colo.

Filed Sept. 11, 1974, Ser. No. 505,029
Int. Cl.[2] C25C 3/08, 7/00
U.S. Cl. 204—269 **16 Claims**



1. An axial flow electrolytic cell comprising in combination:
a. an electrically nonconductive completely closed conduit;
b. end closures for each end of said conduit each of said end closures having an opening therethrough for passage of an ion-containing and conducting medium;
c. a plurality of electrodes in axially spaced relation and transversely disposed across said tubular conduit, each of said electrodes having macro openings extending therethrough;
d. first bus bar means electrically connecting alternate ones of said electrodes; and
e. second bus bar means isolated from said first bus bar means electrically connecting the remaining electrodes.

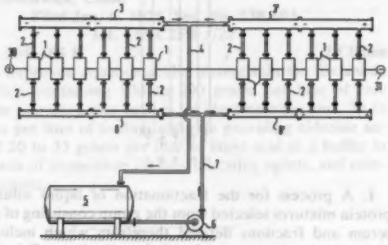
3,972,796

ELECTROLYTIC APPARATUS

Hanns Frohler, Munich, and Erwin Rossberger, Hohenrain, both of Germany, assignors to Dipl.-Ing. Hanns Frohler KG, Pullach near Munich, Germany

Filed Feb. 6, 1975, Ser. No. 547,732
Claims priority, application Germany, Feb. 15, 1974, 2407312
Int. Cl.[2] C25B 1/26, 1/34, 9/00, 9/04
U.S. Cl. 204—269 **7 Claims**

1. Electrolytic apparatus comprising:
a. a plurality of electrolytic cells;
b. a plurality of electrodes in each cell;
c. conductive means for connecting said electrodes to the terminals of a source of direct current in series circuit for sequential flow of said current through said cells in a primary path;
d. a source of an aqueous electrolyte; and
e. a manifold system connecting said cells to said source of an electrolyte in parallel, whereby said system when filled with said electrolyte constitutes a secondary path of current between said terminals, said system including
1. two conduits communicating with each other for flow of said electrolyte therethrough between said source thereof and one of said cells,
2. electrical insulating means preventing direct flow of current from one of said two conduits to the other conduit, said one conduit essentially consisting of a metal selected from the group consisting of titanium,



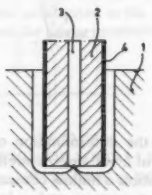
zirconium, tantalum, and austenitic stainless steel, said electrolyte being incapable of significant chemical attack on said metal while causing electrolytic corrosion of said metal when current flows in said secondary path, and
3. a protective electrode conductively connected to said one conduit and having a surface exposed to said electrolyte adjacent said insulating means, said surface consisting of a conductive material resistant to said electrolytic corrosion and said chemical attack.

3,972,797

ELECTRODE FOR ELECTROCHEMICAL MACHINING

Siegfried Hendrik Hagen; Cornelis van Osenbruggen; Herman Anton; Joseph Reemers, and Gerrit Verspui, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 6, 1974, Ser. No. 530,279
Claims priority, application Netherlands, Dec. 12, 1973, 7316992
Int. Cl.[2] C25F 7/00, 3/00, 3/14
U.S. Cl. 204—290 R **4 Claims**

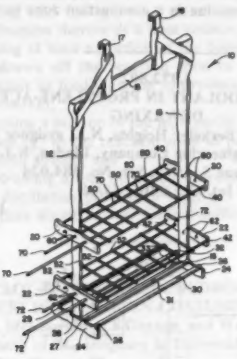


1. An electrode for electrochemically machining an electrically conducting workpiece in an electrolyte solution, said electrode being locally coated with an insulating layer at areas at which current flow is undesired, said insulating coating consisting essentially of two superimposed layers, one layer being a p-type semiconductor polycrystalline layer and the other layer being an n-type semiconductor polycrystalline layer, said insulating coating having a resistance in the electrolyte solution employed such that the ratio of the current density at the noncoated area of the electrode to the current density at the coated area of the electrode is at least 5.

3,972,798
ELECTROPLATING RACK

Stephen P. Palisin, Jr., South Euclid, Ohio, assignor to The Empire Plating Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 479,617, June 17, 1974. This application Dec. 23, 1974, Ser. No. 536,926
Int. Cl.² C25D *17/08*
U.S. Cl. 204—297 W **9 Claims**



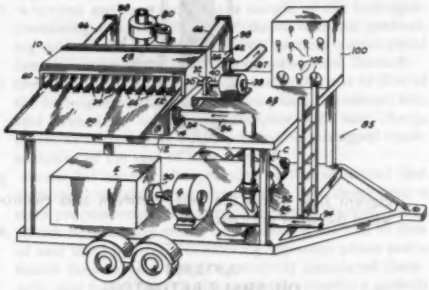
1. An electroplating rack comprising:
a. an elecrically conductive framework including a pair of spaced uprights and bar means extending between and rigidly connecting said uprights near the lower ends thereof;
b. an electrically insulative material coating said framework except in the regions extending across the top of said bar means where exposed, upwardly facing electrode surface portions are defined;
c. a pair of grid structures carried by said framework at vertically spaced positions above said bar means, said grid structures defining a plurality of spaced apertures for receiving and supporting a plurality of long articles on end with their lower ends in electrically conductive engagement with said surface portions; and,
d. said grid structures being adjustable to vary dimensions of at least some of the apertures defined by said grid structures.

3,972,799
APPARATUS FOR REMOVING SOLIDS FROM DRILLING MUD

Julian S. Taylor, 8300 SW. 8, Oklahama City, Okla. 73108, and Dwight C. Birdsong, 7105 Woodridge Ave., Oklahoma City, Okla. 73132

Filed May 27, 1975, Ser. No. 581,080
Int. Cl.² B01D *13/02*; C25B *9/00*
U.S. Cl. 204—300 R **1 Claim**

1. An apparatus for separating solids from drilling mud, comprising:
frame means including a container forming a passageway for drilling mud;
an axle horizontally journalled by said frame transversely of the direction of mud flow through the passageway;
positive electrode means including a disc having a thickened hub portion coaxially secured to said axle,
the opposing side surfaces of said disc converging toward its periphery;
motor means for rotating said axle about its longitudinal axis,
the depending peripheral portion of said disc remaining immersed in the mud as the disc is rotated about its axis;
negative electrode means including a panel disposed parallel with said disc and at least partially immersed in the drilling mud;
a source of direct current connected with and flowing between said positive and negative electrode means whereby,
said drilling mud forms an electrolyte and said solids tend to develope a negative charge and are attracted to and deposited as a film on the surfaces of said disc;
scraper means comprising a planar member overlying a portion of said frame means and extending downwardly and laterally from said axle and having a V-shaped slot in its end portion adjacent said axle cooperatively receiving, in radial contiguous contacting relation, opposing side surfaces of said disc for removing the film of solids from the disc surfaces;



plunger means comprising a plate-like member overlying said frame means opposite said scraper member,
said plunger member having an end portion overlying the end portion of said scraper member adjacent said axle and having a rectangular slot cooperatively receiving opposing side surfaces of the hub portion of said disc,
said plunger member being reciprocable along the upper surface of said scraper member toward the downwardly disposed end of said scraper member for moving solids collected by said scraper member away from said disc; and,
means including a pressure operated cylinder connected with said plunger member for periodically reciprocating said plunger member.

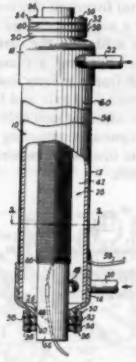
3,972,800
FLUID TREATER HAVING INTENSIFIED ELECTRIC FIELD

Arthur S. King, 8021 Cherokee Lane, Leawood, Kans. 66206

Continuation-in-part of Ser. No. 421,336, Dec. 3, 1973, abandoned. This application Apr. 3, 1975, Ser. No. 564,793
Int. Cl.² B03C *5/02*
U.S. Cl. 204—302 **10 Claims**

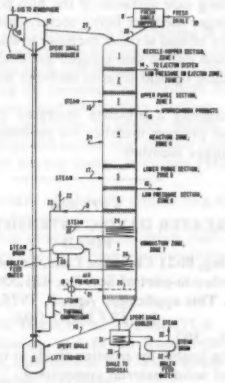
1. A device usable for treating fluids to induce precipitation of suspended solid material comprising:
means defining an elongated, tubular housing having a fluid inlet and a fluid outlet at opposite ends thereof;
an elongated, bare inner electrode coaxially disposed within said housing in radially spaced relationship thereto to define an annular treating region between said housing and said electrode;
an outer electrode surrounding said region; and
means electrically connecting said electrodes across a source of direct potential,
said inner electrode being connected to the negative side of said source for negative charging of the inner electrode, and said outer electrode being connected to the positive side of said source for positive charging of the outer electrode,
said housing-defining means including a continuous cylin-

drical wall of dielectric material disposed between said outer electrode and said region to prevent electrical



current flow across the latter between said electrodes when the latter are charged.

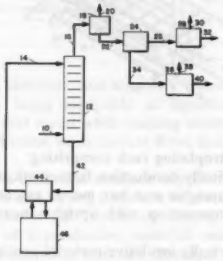
3,972,801
OIL SHALE RETORTING
Armand A. Gregoli, Tulsa, Okla., assignor to Cities Service Research & Development Co., Tulsa, Okla.
Filed Oct. 29, 1974, Ser. No. 518,443
Int. Cl.² C10G *1/02*
U.S. Cl. 208—11 R **3 Claims**



1. A process for the retorting of hydrocarbons from oil shale granules in a retorting vessel in which the oil shale is subjected to thermal decomposition of the kerogen component of the shale by the addition of heat, in the substantial absence of oxygen, and from which distillation reaction products are obtained substantially free of gaseous products of combustion, during the downward passage of shale through a plurality of physically separated zones in the vessel, the process comprising:

a. mixing fresh oil shale and hot spent shale in a hopper zone
b. removing gases from the shale mixture in a first sub-atmospheric pressure zone,
c. subjecting the shale mixture to an inert purge stream in a first purge zone,
d. forming reaction products by thermal decomposition of kerogen in a reaction zone and removing and recovering said reaction products, incidentally forming a carbonaceous residue on the shale,
e. subjecting the retorted shale mixture to an inert purge stream in a second purge zone,
f. removing gases from the retorted shale mixture in a second sub-atmospheric pressure zone, and
g. heating the retorted shale mixture by combustion of its carbonaceous residue in a combustion zone to form hot spent shale.

3,972,802
IMMISCIBLE COOLANT IN PROPYLENE-ACETONE DEWAXING
James D. Bushnell, Berkeley Heights, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.
Filed June 5, 1975, Ser. No. 584,034
Int. Cl.² C10G *43/08*
U.S. Cl. 208—33 **10 Claims**



1. In a dewaxing process wherein a waxy petroleum oil is contacted with a solvent comprising propylene and acetone to form a solvent-waxy oil mixture, the improvement which comprises, in combination, contacting said solvent-waxy oil mixture with a cold solution of aqueous acetone-methanol to reduce the temperature of said mixture and thereby precipitate a substantial portion of the wax therefrom, and separating the precipitated wax from said mixture at wax separation temperature.

3,972,803
PRODUCTION OF LOW SULFUR FUEL OIL AND HYDROGEN FROM PETROLEUM RESIDUUM
Ronald H. Wolk, Trenton, N.J.; Axel R. Johnson, North Babylon, N.Y., and Govanon Nongbri, Newtown, Pa., assignors to Hydrocarbon Research, Inc., Morristown, N.J.
Filed Feb. 15, 1974, Ser. No. 443,025
Int. Cl.² C10G *37/00, 23/10*
U.S. Cl. 208—97 **8 Claims**

1. A process for producing low sulfur fuel oil by the hydroconversion of a petroleum residuum feed material having at least 10% by volume boiling above 975°F and containing at least 2 wt. percent sulfur, which comprises:

a. passing the feed at a temperature between 750° and 900°F and a hydrogen partial pressure of 1000–3000 psig together with at least 4000 scf hydrogen per barrel residuum feed upwardly through an ebullated bed reaction zone containing a hydrogenation type particulate catalyst;
b. controlling the space velocity within the reaction zone between 0.15–1.0 $V_f/hr/V_r$ to accomplish at least 40% conversion of the 975°F plus boiling components in the feed to materials boiling below 975°F and to partially remove sulfur;
c. withdrawing a light hydrocarbon containing gaseous effluent stream from the reaction zone, passing it to a

separation step for separating into gaseous and liquid portions, and recovering medium purity hydrogen from the gaseous portion for recycle to the reaction zone;

d. withdrawing a liquid effluent stream from the reaction zone and passing it to a distillation step;

e. withdrawing a heavy hydrocarbon residue stream from the distillation step, passing said stream with oxygen-containing gas to a gasification step, and producing a fuel gas stream therefrom;

f. passing said fuel gas to a steam-methane reformer for combustion therein as a heat source;

g. passing at least a portion of the light hydrocarbon gases withdrawn off the reaction zone to the steam-methane reformer as feed material to produce high purity hydrogen therein;

h. returning a portion of the high purity hydrogen produced in step (g) to the reaction zone to partially hydrogenate the feed stream; and

i. withdrawing a fuel oil product stream off the separation and distillation process of steps (c) and (d) containing less than about 1.0 wt. percent sulfur.

3,972,804

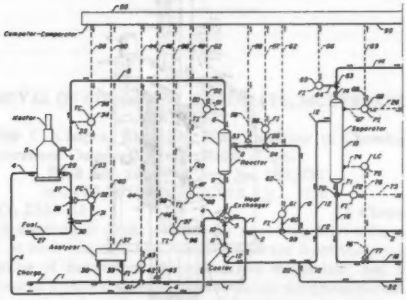
CONTROL OF HYDROGEN/HYDROCARBON MOLE RATIO IN HYDROGEN-CONSUMING PROCESS

James H. McLaughlin, La Grange, and Walter A. Bajek, Lombard, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 511,403, Oct. 2, 1974. This application Dec. 20, 1974, Ser. No. 534,993

Int. Cl.[2] C10G *13/02*

U.S. Cl. 208—108 **12 Claims**



1. In a continuous hydrocarbon conversion process in which hydrogen is consumed, and where (1) a hydrocarbonaceous charge stock and hydrogen are introduced into preheating means having external heat-supplying means operatively associated therewith; (2) the resulting heated charge stock hydrogen mixture is reacted in a catalytic reaction zone; (3) the resulting reaction zone effluent stream is condensed and separated to provide a liquid phase and a first hydrogen-containing vaporous phase; (4) at least a portion of said first vaporous phase is recycled to said preheating means, in admixture with said charge stock; (5) a second hydrogen-containing vaporous phase, from an external source, is introduced into said process, at least a portion thereof is admixed with said first hydrogen-containing vaporous phase and introduced therewith into said preheating means, and (6) at least a portion of said first hydrogen-containing vaporous phase is introduced directly into said reaction zone as a third hydrogen-containing vaporous phase; the control system for regulating the hydrogen/hydrocarbon mole ratio within said reaction zone which comprises, in cooperative combination:

a. first flow-varying means, operatively associated with said preheating means, for adjusting the quantity of heat supplied thereto;

b. first flow-sensing means for measuring the rate of flow of said charge stock to said reaction zone and developing a first process output signal representative thereof, and second flow-varying means for adjusting the rate of flow of said charge stock;

c. a first analyzer receiving a sample of said charge stock and developing a second process output signal representative of a composition characteristic thereof;

d. second flow-sensing means for measuring the rate of flow of said second hydrogen-containing vapaorous phase,e introduced into said process, and developing a third process output signal representative thereof, and third flow-varying means for adjusting the rate of flow of said second vaporous phase;

e. a second analyzer receiving a sample of the hydrogen-containing vaporous phase introduced into said preheating means and developing a fourth process output signal representative of the hydrogen concentration thereof;

f. third flow-sensing means for measuring the rate of flow of the hydrogen-containing vaporous phase introduced into said preheating means, in admixture with said charge stock, and developing a fifth process output signal representative of the rate of flow thereof;

g. means for sensing the pressure of the separated first hydrogen-containing vaporous phase and developing a sixth process output signal representative thereof;

h. fourth flow sensing means for measuring the rate of flow of said third hydrogen-containing vaporous phase and a fourth flow-varying means operatively associated therewith, said fourth flow sensing means developing a seventh process output signal representative of the rate of flow thereof;

i. a third analyzer receiving a sample of said liquid phase and developing an eighth process output signal, said eighth process output signal representative of the composition characteristic of said liquid phase; and

j. comparator means (i) receiving said eight process output signals and, operatively responsive thereto, (ii) generating first, second, thrid and fourth comparator output signals as functions thereof; said control system further characterized in that said comparator means is in communication with said first, second, third and fourth flow-varying means, via signal-transmitting means which transmit at least one of said comparator output signals to at least one of said flow-varying means, whereby at least one of (i) the flow of said charge stock, (ii) the heat supplied to said preheating means, (iii) the flow of said second hydrogen-containing vaporous phase into said process and (iv), the flow of said third hydrogen-containing vaporous phase into said catalytic reaction zone is adjusted in response thereto, and said hydrogen/hydrocarbon mole ratio is regulated.

3,972,805

HYDROCARBON CONVERSION WITH AN ACIDIC, SULFUR-FREE TRIMETALLIC CATALYTIC COMPOSITE

Frederick C. Wilhelm, Ann Arbor, Mich., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 343,743, March 22, 1973, abandoned, which is a continuation-in-part of Ser. No. 15,960, March 2, 1970, abandoned. This application Jan. 6, 1975, Ser. No. 538,827

Int. Cl.[2] C10G *35/06*

U.S. Cl. 208—139 **17 Claims**

1. A process for reforming gasoline which comprises contacting, in a substantially sulfur-free environment, the gasoline at reforming conditions with an acidic sulfur-free catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.01 to about 5 wt. % nickel, about 0.01

to about 5 wt. % tin or lead, and about 0.1 to about 3.5 wt. % halogen, wherein the platinum group metal, nickel, and tin or lead are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal is present in the elemental metallic state, wherein substantially all of the tin or lead is present in an oxidation state above that of the elemental metal, and wherein the major portion of the nickel is present in the elemental metallic state.

3,972,806

HYDROCARBON CONVERSION WITH AN ACIDIC MULTIMETALLIC CATALYST COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed July 3, 1975, Ser. No. 593,086
Int. Cl.[2] C10G *35/08*, *13/10*; C07C *3/34*
U.S. Cl. 208—139 **22 Claims**

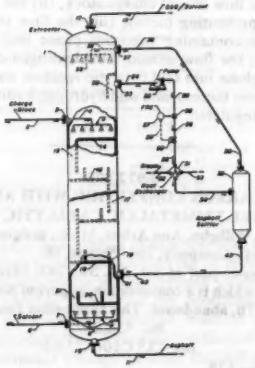
1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % gallium and about 0.1 to about 3.5 wt. % halogen, wherein the platinum group metal, catalytically available cobalt, and gallium are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal is present in the elemental metallic state, wherein substantially all of the gallium is present in an oxidation state above that of the elemental metal, and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

3,972,807

HYDROCARBON DEASPHALTING VIA SOLVENT EXTRACTION

Kenneth D. Uitti, Bensenville, and Bennie I. Bunas, Des Plaines, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed June 25, 1975, Ser. No. 590,185
Int. Cl.[2] C10G *21/14*
U.S. Cl. 208—309 **10 Claims**



1. A process for deasphalting an asphalt-containing hydrocarbonaceous charge stock, in a solvent extraction zone, which process comprises the steps of:

a. countercurrently contacting said charge stock, introduced into said zone through an upper first locus thereof, with a hydrocarbon-selective solvent, introduced into said zone through a lower second locus thereof, at extraction conditions selected to produce a solvent-lean asphaltic stream and a solvent-rich hydrocarbon stream;

b. withdrawing said asphaltic stream from said zone through a lower third locus below the second locus thereof, and a solvent-rich deasphalted oil from said zone through an upper fourth locus above the first locus thereof;

c. withdrawing at least a portion of said solvent-rich hydrocarbon stream from said zone through a fifth locus above the first locus thereof;

d. increasing the temperature of said portion and introducing the heated portion into a separation zone to provide a settled asphaltic phase and a solvent/hydrocarbon phase;

e. introducing said asphaltic phase into said zone through a sixth locus above the second locus thereof; and,

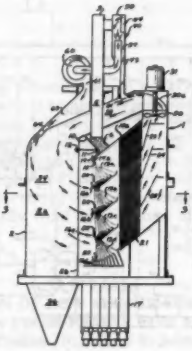
f. introducing said solvent/hydrocarbon phase into said zone through a seventh locus intermediate the first and fifth loci thereof.

3,972,808

PNEUMATIC CLASSIFIER WITH PARTICLE REMOVAL SYSTEM

Russell E. Manley, Portage, Ind., assignor to Manley Bros. of Indiana, Inc., Chesterton, Ind.

Filed Mar. 25, 1974, Ser. No. 454,428
Int. Cl.[2] B07B *4/02*
U.S. Cl. 209—133 **9 Claims**



1. A pneumatic classifier comprising:

feed means for creating a stream of solid material having particles of varying sizes;

classifying means responsive to air flow for receiving said stream to classify the particles into fractions containing substantially uniform sizes;

air flow means operatively coupled to the classifying means to create a controlled air flow for contacting the stream to effect classification of a substantial portion of the particles into fractions;

particle collection means operatively mounted adjacent the classifying means to collect unclassified particles of the stream other than said substantial portion which unclassified particles remain in said controlled air flow after passing through the classifying means;

said particle collection means including particle removal means in fluid communication with an inlet means and an outlet means, said inlet means being mounted adjacent said controlled air flow means for extracting a portion of

the controlled air flow having unclassified particles to be collected and said outlet means mounted downstream of said particle removal means for returning particle free air to the controlled air flow without disturbance thereto;

said particle removal means including means for creating a secondary air flow between said inlet means and said outlet means; and

housing means for confining the controlled air flow created by said air flow means into a confined circulating flow through said classifying means, said inlet means and said outlet means extending substantially the width of the controlled air flow in said housing means.

3,972,809

TREATMENT OF CONDENSATES

Thomas Kleeman, and Willy Rothmayr, both of La Tour-de-Peilz, Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Dec. 11, 1973, Ser. No. 423,660

Claims priority, application Switzerland, Dec. 14, 1972, 18196/72

Int. Cl.² C02B *1/42, 1/56*

U.S. Cl. 210—24 **9 Claims**

1. In a process for the treatment of aqueous extract of vegetable material selected from the group consisting of coffee, tea, and chicory wherein said extract is stripped to recover aromatic constituents and then subjected to concentration by evaporation, and wherein incident to said concentration vapours are emitted by said extract and are then condensed to form an aqueous liquid, the improvement which comprises purifying said condensed liquid through contact with at least one ion exchange resin.

3,972,810

REMOVAL OF CHROMIUM, CHROMATE, MOLYBDATE AND ZINC

Randhir C. Chopra, Knoxville, Tenn., assignor to Chemical Separations Corporation, Oak Ridge, Tenn.

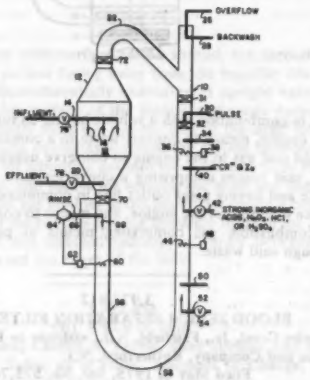
Filed July 15, 1974, Ser. No. 488,630

Int. Cl.² B01D *15/02*; C02B *1/42, 1/56*

U.S. Cl. 210—33 **2 Claims**

1. A continuous cyclic process for removing from influent water at least one of a first member selected from the group consisting of hexavalent chromium and molybdate, and at least one of a second member selected from the group consisting of trivalent chromium and zinc comprising

1. introducing said water containing said first and second members entrained therein into the upper portion of a first section of an ion exchange vessel having a shiftable ion exchange resin bed therein and causing said water to flow downwardly through said ion exchange resin bed consisting essentially of a mixture of weak base anion exchange resin and weak acid cation exchange resin in hydrogen ion form, wherein each type resin is present in said mixture in an amount of at least 20 percent by volume of the total volume of said resin mixture and wherein said weak acid cation exchange resin is present in an amount sufficient to supply sufficient hydrogen ions so that said first member is transferred from said water to said weak base anion exchange resin even when said influent water is not acidic, whereby said first and second members are transferred, respectively, to said weak base anion exchange resin and to said weak acid cation exchange resin;
2. withdrawing from the lower portion of said first section the resulting water with substantially reduced amounts of said first and second members;
3. introducing a first regenerating agent into one portion of a second section of said ion exchange vessel containing said mixture of weak base anion exchange resin loaded with said first member and weak acid cation exchange resin loaded with said second member, from (1) and causing said first regenerating agent to contact said ion exchange resin mixture;
4. withdrawing from said one portion of said second section said first regenerating agent containing one of said first and second members,
5. essentially simultaneous with the introduction of said first regenerating agent in (3) introducing a second regenerating agent into another portion of said second section of said ion exchange vessel containing said mixture of weak base anion exchange resin and weak acid cation exchange resin previously treated in (3) and causing said second regenerating agent to contact said ion exchange resin mixture;
6. withdrawing from said another portion of said second section said second regenerating agent containing the other of said first and second members;
7. transferring ion exchange resin generated at (5) in said second section and introducing the same into the lower



portion of said first section for contact with water containing said first and second members, thereby displacing ion exchange resin loaded with said first and second members from the upper portion of said first section;

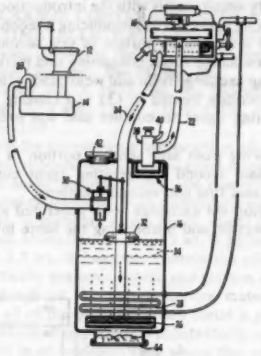
8. transferring said ion exchange resin loaded with said first and second members and displaced from the upper portion of said first section to another section of said ion exchange vessel communicating therewith, thereby displacing another portion of said ion exchange resin loaded with said first and second members from said another section;
9. transferring said another portion of said ion exchange resin loaded with said first and second members and displaced from said another section to said one portion of said second section for regeneration therein;
10. detecting the presence of contaminants in the ion exchange resin bed being transferred between the said second section and said first section and in response thereto introducing resin rinse medium into said ion exchange vessel intermediate said first and second section in a direction countercurrent to the transfer of said resin thereby establishing the introduction of substantially contaminant-free ion exchange resin into said first section.

3,972,811

WASTE CONVERTER SYSTEM AND METHOD

Allan T. Larkins, Jr., 120 Canal St., San Rafael, Calif. 94901, and Dalton L. Alander, 1513 Sarkesian Drive, Petaluma, Calif. 94952

Filed Apr. 30, 1975, Ser. No. 573,016
Int. Cl.² C02C 5/06
U.S. Cl. 210—71 5 Claims



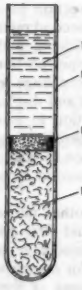
1. In combination with a vehicle having an internal combustion engine, means to convert waste to a combustible gas and to add said gas to the engine to conserve usage of the normal fuel, said means comprising a converter tank to contain the waste and having a gas outlet line in communication with the intake manifold of the engine, and means to convert the waste to combustible gas comprising means to pass heated air through said waste.

3,972,812

BLOOD SERUM SEPARATION FILTER DISC

Charles Gresl, Jr., Fairfield, N.J., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Filed May 8, 1975, Ser. No. 575,740
Int. Cl.² B01D 21/26
U.S. Cl. 210—77 14 Claims



1. A separation device for insertion into a tubular container for isolating the lighter components from the heavier components of blood mixtures selected from coagulated whole blood and mixtures of whole blood with anti-coagulants comprising:

a cylindrical disc made of an inert porous polymeric material having a pore size of about 70 to 300 microns, the said disc having a diameter sized to form a sliding fit with the inner wall of the tubular container and a height sized to maintain the disk coaxial with respect to the tubular container;

said disc being coated with a hydrophobic material to make the surfaces of the porous material of the disc hydrophobic to increase the descent time of the disc through the soluble components;

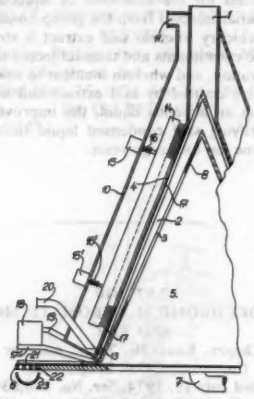
said coated disc having a specific gravity such that it will sink in said lighter components but will not sink in said heavier components.

3,972,813

METHOD OF REMOVING SOLID PARTICLES FROM A MIXTURE COMPRISING A VISCOUS LIQUID, AND SEPARATOR FOR THE CARRYING OUT OF THIS METHOD

Roman Ziolkowski, 10, rue Dom Plancher, 21160 Marsannay-la-Cote, France

Filed Mar. 21, 1974, Ser. No. 453,552
Claims priority, application Switzerland, Mar. 22, 1973, 4146/73
Int. Cl.² B01D 29/38
U.S. Cl. 210—79 7 Claims



1. Apparatus for removing solid particles from a viscous liquid comprising, means defining a compartment into which a flow of a mixture of viscous liquid with solid particles suspended therein is continuously flowed downwardly during operation, said compartment having a first upstanding perforated wall and a second upstanding perforated wall confronting the first perforated wall, means to continuously apply air pressure to the first perforated wall from externally of the compartment into the compartment toward said second perforated wall and to the flowing mixture therethrough, means for keeping said mixture from flowing through the perforations of said second perforated wall, said means comprising a plurality of axially reciprocated partial plugs extending axially into the second perforated wall perforations from externally of the compartment to keep particles from filling and passing through said perforations and to restrict flow therethrough to only said flow of liquid, means to selectively reciprocably actuate the plugs axially into said compartment to maintain the perforations of said second perforated wall clean and unobstructed, means for supplying said mixture into said compartment, means isolated from the means to continuously apply air pressure for applying a vacuum to the perforations of the second perforated wall from externally of the compartment to effect said flow of liquid therethrough, means to collect the liquid passing out from said compartment through the perforations of said second perforated wall, a plurality of driven scrapers in said compartment, said scrapers been con-

structed and arranged for scraping inner surfaces of the second perforated wall to remove solid particles therefrom when said plugs are retracted from said compartment, and means to remove solid particles collected in the bottom of said compartment.

3,972,814

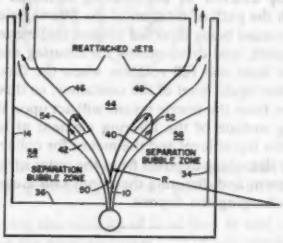
FLUIDIC OIL-WATER SEPARATOR

Aleksy J. Paszyc, Ventura; Dharam Pal, Woodland Hills, and John B. Curry, Oxnard, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 12, 1975, Ser. No. 549,245

Int. Cl.² B01D *21/26*

U.S. Cl. 210—84 **13 Claims**



1. An apparatus for separating oil from an oil-water mixture utilizing the Coanda effect comprising:

a. an enclosed cavity having an inlet port, an outlet port, and first and second offsetted walls disposed between flat plates, said inlet port including a nozzle for directing said oil-water mixture parallel to and spaced from each said offsetted walls;

b. means located inside said enclosed cavity for splitting said oil-water mixture into a first and a second jet having respective first and second velocity profiles as said oil-water mixture enters said enclosed cavity via said inlet port nozzle;

c. said splitting means, said first and second offsetted walls, and said flat plates forming respective first and second bounded regions within said enclosed cavity into which said first and second oil-water mixture jets are respectively directed from said inlet port by said splitting means, said apparatus operating essentially in two dimensions to form first and second separation bubbles in respective said first and second bounded regions by attachment of respective said first and second jets to respective said first and second offsetted walls due to said Coanda effect, said first and second velocity profiles being a maximum adjacent said splitting means such that more than one-half the oil in each said first and second jet experiences a force vector in the direction of respective said first and second separation bubbles;

d. means attached to said enclosed cavity and communicating with said first and second bounded regions for extracting and collecting oil from said first and second separation bubbles.

3,972,815

MIXING APPARATUS

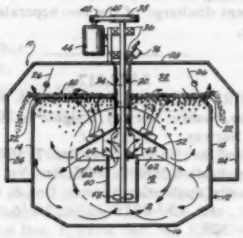
Theodore H. O'Cheskey, Whittier; Carroll C. Bunker, Covina, and Hugh T. Edwards, Jr., Whittier, all of Calif., assignors to United States Filter Corporation, Whittier, Calif.

Filed Jan. 9, 1975, Ser. No. 539,838

Int. Cl.² B03D *1/00*

U.S. Cl. 210—219 **19 Claims**

1. Mixing apparatus comprising a tank for holding a volume of liquid; and upright draft tube disposed within the tank for extending below an operating level of the liquid; an upright shaft disposed within the draft tube; an impeller blade secured to the shaft at a location below the operating level of the liquid and below the extent of the draft tube; an outwardly and downwardly inclined shroud located at the lower end of the draft tube and extending circumferentially away from the lower end of the draft tube and above the impeller blade, the shroud having an undersurface facing the impeller blade and being in substantially uninterrupted fluid communication therewith so that an upwardly circulating pattern of bubbles formed in the liquid by rotation of the impeller blade impinges



directly on the undersurface of the shroud, the shroud also having a top surface facing away from the impeller blade; a plurality of circumferentially spaced apart upright vanes secured to the top surface of the shroud, the vanes extending radially outwardly from the upright axis of the draft tube; a plurality of holes extending through the shroud between the vanes; means for admitting gas into the draft tube to be mixed with the liquid; and means for rotating the shaft and impeller blade to entrain gas bubbles in the liquid and create a circulation pattern of the bubbles passing upwardly through the holes in the shroud and directed radially outwardly between the vanes and toward the edges of the tank.

3,972,816

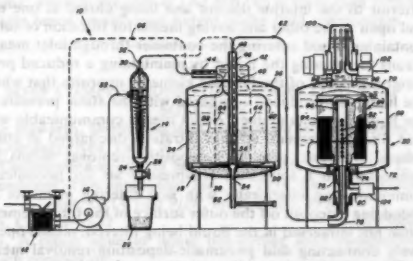
OIL EXTRACTOR

Paul Mail, Tulsa; Charles R. Ferrin, Sand Springs, and Richard J. Ely, Tulsa, all of Okla., assignors to Change, Inc., Tulsa, Okla.

Filed Aug. 23, 1974, Ser. No. 500,027

Int. Cl.² B01D *17/04*

U.S. Cl. 210—259 **2 Claims**



1. An apparatus for extracting solids and oil from an effluent and comprising filter trap means for initially receiving the effluent therethrough, centrifuge means in communication with the filter trap for receiving the filtered effluent therefrom and separating the effluent into lighter and heavier components, de-emulsifier means in communication with the centrifuge means for receiving the lighter components therefrom, said de-emulsifier being provided with a granular bed for filtering the effluent and to create a mixture having two distinctive phases, said de-emulsifier means including a housing to receive said effluent means to pass said effluent down-

wardly through said granular bed, horizontal tray means provided in said housing upon which said granular bed rests, vertical and central riser tube means through said granular bed and housing which is in open communication with said tray means to dischcarge said two phase mixture, and backwash means to clear said granular bed, separator means in communication with the de-emulsifier means for receiving the two phase mixture therefrom, removable granular filled cartridge means provided in said separator means for receiving the two phase mixture therein, means provided in said cartridge means for flowing said mixture radially outward therethrough thereby separating the two phases of the mixture, and means for independent discharge of the two separated phases from the separator.

3,972,817

FILTER, ESPECIALLY FOR BACK WATER

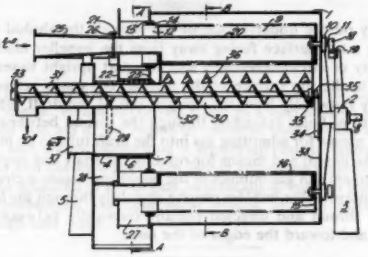
Per Jacob Moe, Nesbru, Norway, assignor to Myrens Verksted A/S, Oslo, Norway

Continuation of Ser. No. 422,848, Dec. 7, 1973, abandoned. This application June 9, 1975, Ser. No. 584,926

Claims priority, application Norway, Dec. 8, 1972, 4549/72

Int. Cl.² B01D *33/00, 35/16*

U.S. Cl. 210—325 **8 Claims**



1. In a filter apparatus for continuously separating solids from liquid, said filter apparatus comprising a closed, substantially cylindrically-shaped container including therein a plurality of axially-disposed, elongated filtering elements circumferentially spaced in substantially mutally parallel relation about the longitudinal axis of said container, said filtering elements comprising a medium for accumulating a deposit on the outer surface thereof when a liquid being filtered passes from the exterior to the interior thereof and being closed at one end and open at the other and having means for filtration of solids containing liquid entering the container through inlet means, means for filtering the liquid by maintaining a reduced pressure on the side of the filtering elements opposite that which the liquid is introduced compared with the static pressure of the liquid in the container, outlet means communicable with said filtering elements so that filtrate is discharged at atmospheric pressure, pneumatic-deposition-removal means for connection to a source of compressed air for periodically communicating interiorally with said filtering elements for dislodging a deposit off the outer surface of the filter elements while not immersed in the liquid being filtered, means operatively connecting said pneumatic-deposition-removal means and filtering elements to move relative to each other and for bringing said open ends of the filter elements sequentially into communication with the source of compressed air, and means for collecting and discharging the deposit from the filtering elements, the improvement comprising, in combination, in which said container is mounted for rotation about a horizontal axis coinciding with the longitudinal axis of the cylinder and having opposite end walls between which end walls said filtering elements extend, means supporting the filtering elements on the end walls of the cylinder for rotation about the horizontal axis together with said closed container and for successive dynamic submergence of the filtering elements into and out of solids containing liquid, means for maintaining a predetermined level of liquid in the container so that the filtering elements will thereby be subjected to hydraulic pressure varying between a minimum and a maximum, said open ends of the filtering elements extending through one extreme end wall of the container to permit unobstructed discharge of the filterate after the liquid to be filtered has passed from the container into the filtering elements from the outside to the interior thereof, said pneumatic-deposition-removal means comprising an elongated slot-shaped nozzle means extending axially within each filter element and being adapted to act on a limited portion of the interior of the respective filtering elements, said filtering elements being mounted for rotation about its respective longitudinal axis relative to the slot-shaped nozzle means, said means for collecting the deposit from the exterior of the filtering elements being mounted beneath the path of rotation of the filtering elements and said nozzle means being directed toward said means for collecting the deposit, and drive means for rotating each filtering element at least one full rotation when the filtering element is above the liquid level of the container, so that the pneumatic pressure from the nozzle means will act upon the total interior filtering surface of the filtering element at least once when above the liquid level and the means for collecting the deposit thereby detaching deposits from the outer surface of the filtering element and directing them into said means for collecting and discharging the deposit.

3,972,818

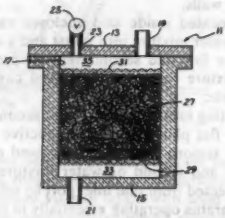
BLOOD FILTER USING GLASSY CARBON FIBERS

Jack C. Bokros, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Aug. 22, 1974, Ser. No. 499,505

Int. Cl.² B01D *27/00*

U.S. Cl. 210—435 **1 Claim**



1. A disposable device for treating human blood prior to its return to a particular, single living human body, which device comprises a housing having a chamber formed therein, entrance means and exit means communicating with said chamber, and a bed of fibers disposed in said chamber so that a liquid must pass through said bed in order to travel from said entrance to said exit, said fiber bed being made up of individual fibers between about 1 micron and about 100 microns in diameter, said individual fibers being formed of impermeable glassy carbon, which glassy carbon constitutes the outer surface of said fibers.

3,972,819

COALESCENCE APPARATUS

Jacob Pielkenrood, Krommenie, Netherlands, assignor to Pielkenrood-Vinitex B.V., Assendelft, Netherlands

Filed Nov. 7, 1974, Ser. No. 521,573

Int. Cl.² B01D *21/00*

U.S. Cl. 210—513 **15 Claims**

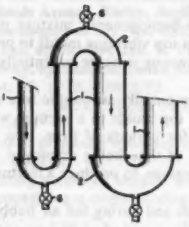
1. In combination with gravitational separation apparatus for the gravitational separation of particles suspended in a fluid;

fluid conduit means for causing the coalescence of particles suspended in a fluid in said conduit, including

an inlet end in communication with a source of fluid,

an outlet end in communication with said separation apparatus for separation of particles in the latter by gravity,

means for increasing the collision frequency of particles in a fluid within said conduit including



corrugations in at least one fluid-contacting wall of said conduit for generating velocity gradients in the fluid, and

means for slowing the velocity of fluid flow in said conduit by increasing the cross-sectional area of said conduit in a direction toward said separator.

3,972,820
FIRE EXTINGUISHING COMPOSITION

Harold E. Filter, Midland, and Don L. Stevens, Sanford, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 20, 1973, Ser. No. 426,885
Int. Cl.[2] A62C 1/00; A62D 1/00; C06B 29/08
U.S. Cl. 252—5 **12 Claims**

1. A fire extinguishing composition comprising a solid mixture of:

a. 25 to 85 weight percent a thermally disseminable halogen-containing compound possessing fire extinguishing ability selected from the group consisting of hexachlorobenzene, hexabromobenzene, perchloropentacyclodecane, ar-dibromotoluene, 1,2,3,4-tetrachlorodibromobutane, decabromodiphenyl oxide, tribromopentyl alcohol, ar-tetrabromo-x-diethyl benzene, ar-tetrabromo-o-xylene, octachloronaphthalene, pentachlorotoluene, 1,2,4,5-tetrabromobenzene, 1,2,4,5-tetrachlorobenzene, polybrominated naphthalenes, dibromotetrafluoroctane, 1,2-dibromo-1,1-dichloroethane, 1,2-dibromo-3-chloropropane, and ar-dibromoethylbenzene;

b. 15 to 45 weight percent an oxidizer; and

c. 3 to 50 weight percent a binder fuel;

said halogen-containing compound being uniformly dispersed throughout the solid mixture.

3,972,821
HEAT TRANSFER COMPOSITION AND METHOD OF MAKING

William A. Weidenbenner, Dallas, Tex., and Irvin J. Steltz, North Wales, Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Continuation-in-part of Ser. No. 355,839, April 30, 1973, Pat. No. 3,908,064, which is a continuation-in-part of Ser. No. 258,277, May 31, 1972, abandoned. This application July 23, 1975, Ser. No. 598,453
Int. Cl.[2] C09K 5/00; C08L 63/00; C09J 3/12, 3/14
U.S. Cl. 252—75 **21 Claims**

1. A heat transfer composition consisting essentially of:

a. particulate solids having a thermal conductivity of at least 100 BTU/inch/hr/sq.ft./deg. F;

b. epoxy resin;

c. high temperature curing agent which is inactive at oridinary room temperature;

d. nitrile rubber;

e. polybutene;

f. cold flow control agent.

3,972,822
WATER-INSENSITIVE AND STABLE HYDRAULIC FLUID COMPOSITIONS

Teruyuki Sato, Kyoto, and Motohiko Ii, Uji, both of Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto, Japan

Filed Dec. 3, 1974, Ser. No. 529,079
Claims priority, application Japan, Dec. 3, 1973, 48-138482
Int. Cl.[2] C10M 3/48; C09K 3/00
U.S. Cl. 252—78.1 **8 Claims**

1. A hydraulic fluid composition which comprises (A) 40 to 65% by weight, based on the total weight of the fluid composition, of a polyglycol monoether having the formula:

$$R_1 + OA_x\rangle_{\overline{70}} OH \qquad (1)$$

(wherein R_1 is alkyl having 1 to 4 carbon atoms, A_1 is alkylene having 2 to 4 carbon atoms, and x is 3 to 5); (B) 16 to 45% by weight, based on the total weight of the fluid composition, of a polyglycol having the formula:

$$H + A_y\rangle_{\overline{70}} OH \qquad (2)$$

(wherein A_2 is alkylene having 2 to 4 carbon atoms, and y is 2 to 7); and (C) 10 to 19% by weight, based on the total weight of the fluid composition, of a borate ester of the formula:

$$[R_2 + OA_z\rangle_{\overline{70}} O]_3 B \qquad (3)$$

(wherein R_2 is alkyl having 1 to 4 carbon atoms, A_2 is alkylene having 2 to 4 carbon atoms, z is 3 to 5, and B is the boron atom); wherein the sum of (A) and (B) is more than 80% by weight based on the total weight of the fluid composition.

3,972,823
SOAP COMPOSITIONS FOR NON-GELLING SOAP SOLUTION

Eric Howarth, Derby, England, assignor to H. Kohnstamm & Company, New York, N.Y.

Continuation-in-part of Ser. No. 150,161, June 4, 1971, abandoned. This application Jan. 17, 1974, Ser. No. 434,054
Int. Cl.[2] C11D 9/26, 9/48, 10/06, 17/08
U.S. Cl. 252—132 **4 Claims**

1. A dilute aqueous liquid non-gelling soap composition which consists of:

a. a major amount of water by weight and,

b. a minor amount of less than 10% by weight of a powder dissolved therein having a titre of from 40° – 44°C said powder consisting of:

1. From at least 50 to about 95% by weight of a dry neutral alkali metal soap of a fatty acid or mixture of fatty acids having a titre of from about 36° – 42°C and,

2. from about 5 – 50% of a free fatty acid of a titre of at least 42°C having from about C_{12} to C_{22} Carbon atoms in the fatty acids therein, sufficient to prevent gellation

and wherein the fatty acid component of the composition acts as a stabilizer for the composition when the same is further dissolved in water.

3,972,824

METHOD FOR CLEANING NITROGEN OXIDES FROM AIR

Mike M. Fooladi, Vicksburg, Miss., assignor to Vicksburg Chemical Co., Vicksburg, Miss.

Filed Sept. 25, 1974, Ser. No. 509,128
Int. Cl.² B01D *53/00, 47/02*
U.S. Cl. 252—364 5 Claims

1. A composition for treating mixtures of nitrogen oxides and air whereby to scrub and clean the nitrogen oxides from the air, said composition consisting essentially of a mixture of 20% to 30% chloroform, 20% to 30% methyl alcohol, 20% to 30% ethyl alcohol and 5% to 10% n-hexane, all percentages being by volume of the composition.

3,972,825

LOSS-OF-DRY INHIBITORS FOR SURFACE-COATING COMPOSITIONS

Roy T. Gottesman, Glen Rock; George M. Kagan, Edison, and Joseph Fath, Princeton, all of N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Division of Ser. No. 435,075, Jan. 21, 1974, Pat. No. 3,901,837. This application Jan. 6, 1975, Ser. No. 538,615
Int. Cl.² C09K *3/00*
U.S. Cl. 252—382 6 Claims

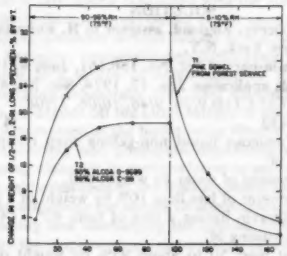
1. A loss-of-dry inhibitor for surface-coating compositions containing oxidizable organic vehicles that is a solution of a mixture of metal salts in an inert non-polar organic solvent, said solution containing 0.05 to 1.5% by weight of cobalt, 0.5 to 3.5% by weight of calcium, and 0.5 to 5.0% by weight of zinc or zirconium, the cobalt, calcium, zinc, and zirconium being present in the solution as salts of acids selected from the group consisting of branched-chain aliphatic monocarboxylic acids having 6 to 14 carbon atoms, cycloaliphatic monocarboxylic acids having 6 to 10 carbon atoms, and mixtures thereof.

3,972,826

FUEL MOISTURE ANALOG

Michael Allen Fosberg, Fort Collins, Colo.; James Wallace Lancaster, Star, Idaho; Mark Joseph Schroeder, Riverside, Calif., and Jerry D. Plunkett, Denver, Colo., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 14, 1975, Ser. No. 604,860
Int. Cl.² C09K *3/00;* G01N *5/02*
U.S. Cl. 252—408 2 Claims



COMPARISON OF HUMIDITY RESPONSE OF A CALCIUM ALUMINATE-BONDED ACTIVATED ALUMINA (MIC-F) WITH THAT OF WOOD (MIC-I) WHEN CHANGES ARE BASED ON PERCENTAGE BY WEIGHT

1. A method for preparing inorganic fuel moisture analog sensors that contain 50 parts by weight of activated alumina, 50 parts by weight of calcium aluminate and 61.2 parts by weight of water, which method consists of the following operational steps carried out in sequence:

a. drying a portion of activated alumina to produce a quantity of dry activated alumina of uniform moisture content;
b. mixing 61.2 parts by weight of water with 50 parts by weight of the dried and sized activated alumina of step (a) to produce an alumina saturated with respect to water;
c. mixing 50 parts by weight of calcium aluminate with the water-saturated alumina of step (b) to produce a homogeneous mixture;
d. introducing the homogeneous mixture of step (c) into preselected open top vibrating molds to produce a tightly packed homogeneous mixture essentially free from air bubbles;
e. subjecting the essentially air bubble free mixture of step (d) still in open top molds to a vacuum within the range 0.5 to 1.0 torr for periods of from 1 to 3 minutes, the longer intervals of time being employed with the lower vacuum range regions, to produce a mixture free of residual air bubbles;
f. closing the molds and curing the air bubble free mixture of step (e) first for a period of 20 hours at a temperature of 75°F and subsequently with molds open, for a period of 48 hours at a temperature of 165°F the latter curing period being carried out in an atmosphere saturated with respect to water;
g. finally equilibrating the mixture in open molds for 96 hours at a temperature of 165°F, the humidity being ambient, to produce the finished inorganic fuel moisture analog sensor.

3,972,827

SILVER DETECTING FORMULATION

William A. Rhodes, 4421 N. 13th Place, Phoenix, Ariz. 85014

Filed Sept. 12, 1975, Ser. No. 612,635
Int. Cl.² G01N *31/22*
U.S. Cl. 252—408 2 Claims

1. A silver detecting formulation comprising the following elements in substantially the following proportions: approximately 300 ml. of water; approximately 36 grams of sulfuric acid, having a specific gravity of approximately 1.275; and approximately 24 grams of potassium-dichromate.

3,972,828

CATALYST COMPRISING MAGNESIUM OXIDE AND A CELLULOSIC POLYMERIC BINDER

Bernardus J. Van Sorge, Selkirk, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 846,925, Aug. 1, 1969, Pat. No. 3,843,606. This application July 12, 1974, Ser. No. 487,923
Int. Cl.² B01J *31/02*
U.S. Cl. 252—430 6 Claims

1. A porous catalyst comprising a mixture of magnesium oxide bonded with from 1–15% by weight of an inert, organic cellulosic polymeric binder, the catalyst having a surface area of at least 20 square meters per gram.

3,972,829

METHOD OF DEPOSITING A CATALYTICALLY ACTIVE METALLIC COMPONENT ON A CARRIER MATERIAL

Edward Michalko, Chicago, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 7, 1974, Ser. No. 521,978
Int. Cl.² B01J *31/02*
U.S. Cl. 252—430 15 Claims

1. A method of distributing a catalytically active metallic component over the available surface area of a porous carrier material in a crystallite size of less than about 25 Angstroms which comprises commingling said carrier material with a common solution of a precursor compound of said catalytically active metallic component and an organic thio acid or a

mercaptocarboxylic acid in a mole ratio of from about 1:1 to about 10:1, adjusting the pH of said solution to between about 5 and about 7 by addition of a basic reagent and impregnating said porous carrier material with the solution of adjusted pH, and thereafter drying and calcining the resultant mixture.

3,972,830

SILVER CATALYSTS

Derek Bryce-Smith, Highland Wood House, Mill Lane, Kidmore End, near Reading, Berkshire, and Ernest Thomson Blues, 36 Reeds Avenue, Earley, Berkshire, both of England

Continuation-in-part of Ser. No. 433,537, Jan. 15, 1974, abandoned. This application Jan. 6, 1975, Ser. No. 538,706

Claims priority, application United Kingdom, Jan. 25, 1973, 3902/73; Sept. 19, 1973, 43995/73

Int. Cl.² B01J *31/02*

U.S. Cl. 252—430 **4 Claims**

1. A method of preparing a supported silver catalyst which comprises the steps of:
1. impregnating a catalyst support with a solution of silver acetate containing a non-reducing tertiary amine and/or amide,
2. drying the said impregnated catalyst support whereby silver acetate is retained on the support together with adsorbed said amine and/or amide,
3. heating the impregnated dried support containing adsorbed amine and/or amide at a temperature of at least 140°C. until a yellow or yellowish-red color is generated on the said support, and
4. continuing the heating at least until blackening of the support composition is effected.

3,972,831

NITROGEN OXIDE REDUCTION SYSTEM

Harold Beuther; Thaddeus P. Kobylinski, and Harold E. Swift, all of Gibsonia, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 239,957, March 31, 1972, abandoned. This application Oct. 24, 1973, Ser. No. 409,263

Int. Cl.² B01J *21/02*

U.S. Cl. 252—432 **7 Claims**

1. A microporous glass body suitable for converting nitrogen oxides in auto exhaust gases at low temperatures without the formation of appreciable amounts of ammonia carrying substantially solely ruthenium, said glass body consisting essentially of the following composition:

Component	Weight Per Cent
SiO_2	80–97
B_2O_3	3–15
K_2O }	0.3–1
Na_2O }	
Al_2O_3	0.3–1.5

wherein the surface area of said glass body is in the range of about 40 to about 300 square meters per gram, with the pore radius thereof being from about 10 to about 70 A, the ruthenium being distended on said glass body and covering about 20 to about 0.3 per cent of the surface thereof with a thickness of about 1 to about 10 monomolecular layers of said metal.

3,972,832

PHOSPHORUS-CONTAINING ZEOLITE CATALYST

Stephen A. Butter, East Windsor, and Warren W. Kaeding, Westfield, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 23, 1974, Ser. No. 508,308

Int. Cl.² B01J *27/14, 29/06*

U.S. Cl. 252—437 **32 Claims**

1. A composition of matter comprising a crystalline aluminosilicate zeolite containing hydrogen ions, having a silica to alumina ratio of at least about 12, a constraint index of about 1 to 12, said zeolite having been contacted with a phosphorus compound to combine therewith at least about 0.78 percent by weight of phosphorus.

14. The process for preparing a phosphorus-containing zeolite which comprises contacting a zeolite containing hydrogen ions with a phosphorus-containing compound and thereafter heating, wherein said zeolite containing hydrogen ions is a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12 and a constraint index of about 1 to 12.

3,972,833

HYDROTREATING CATALYST

Edward Michalko, Chicago, and Lee Hilfman, Mount Prospect, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 17, 1974, Ser. No. 533,578

Int. Cl.² B01J *37/02, 29/06*

U.S. Cl. 252—453 **9 Claims**

1. A catalytic composite of from about 5 to about 20 wt. % Group VIB metal or metal oxide and from about 0.1 to about 10 wt. % Group VIII metal or metal oxide on a silica-alumina carrier material, said carrier material having been prepared by:
a. precipitating from a common aqueous solution of alumina sulfate and ammonium hydroxide having a pH of from about 5.5 to about 6.5 an insoluble basic aluminum sulfate characterized by an $SO_3Al_2O_3$ mole ratio of from about 0.4 to about 0.6 and a particle size of from about 1 to about 10 microns;
b. suspending said insoluble basic aluminum sulfate in an acidic silica sol having a pH of from about 1 to about 3;
c. dispersing the resultant suspension as droplets in a hot, water-immiscible suspending media, and retaining the droplets therein until they set to firm spheroidal hydrogel particles;
d. aging the spheroidal hydrogel particles in an aqueous alkaline solution at conditions to hydrolyze residual basic aluminum sulfate contained therein; and
e. washing, drying and calcining the aged spheroidal particles.

3,972,834

CATALYST CARRIERS

Colin Washbourne, Birmingham, England, assignor to Foesco International Limited, Birmingham, England

Filed Apr. 26, 1974, Ser. No. 465,143

Claims priority, application United Kingdom, May 11, 1973, 22704/73

Int. Cl.² B01J *29/06, 35/00*

U.S. Cl. 252—455 R **6 Claims**

1. A ceramic material consisting essentially of a cellular ceramic body having ceramic fibres bonded to its internal surfaces, said ceramic fibres substantially increasing the turbulence induced in a fluid passing through said ceramic body.

6. A supported catalyst comprising as support a ceramic material consisting essentially of a cellular ceramic body having ceramic fibres bonded to its internal surfaces, said ceramic fibres substantially increasing the turbulence induced in a fluid passing through said ceramic body.

3,972,835

FLUID CRACKING CATALYST BASED ON SILICA SOL MATRIX

Gordon H. Hoffman, Baltimore; Richard J. Nozemack, Lutherville, and Curtis Homer Elliott, Jr., Baltimore, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Apr. 23, 1974, Ser. No. 463,326
The portion of the term of this patent subsequent to Feb. 18, 1992, has been disclaimed.
Int. Cl.² B01J 29/06
U.S. Cl. 252—455 Z 5 Claims

1. A process for preparing a cracking catalyst having high activity and high density which comprises:

a. preparing a silica sol having a silica content of about 1 to 8 weight percent which is essentially free of sodium and passing said solution through an ion exchange resin bed,

b. adding clay in an amount equal to 0–70 weight percent of the finished catalyst to said sol,

c. preparing a water slurry of a faujasitic zeolitic aluminosilicate and adjusting the pH to about 3 to 6,

d. mixing said slurry with the silica sol-clay slurry,

e. spray drying and recovering the catalyst product.

3,972,836

PREPARATION OF ORTHO-ALKYLATED PHENOLS

Bernardus J. Van Sorge, Selkirk, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 114,698, Feb. 11, 1971, abandoned, which is a continuation-in-part of Ser. No. 846,973, Aug. 1, 1969, abandoned, which is a continuation-in-part of Ser. No. 717,919, April 1, 1968, abandoned. This application Dec. 19, 1974, Ser. No. 534,271
Int. Cl.² B01J 23/02, 23/34
U.S. Cl. 252—471 16 Claims

1. A catalyst comprising a mixture of magnesium oxide with a manganese oxide and having a surface area of at least 20 sq. meters per gram.

3,972,837

CATALYST FOR PURIFYING AUTOMOTIVE EXHAUST GASES

Gary James Keith Acres; Barry John Cooper; Alan Francis Diwell, and William David James Evans, all of London, England, assignors to Johnson Matthey & Co., Limited, London, England

Filed June 28, 1974, Ser. No. 484,314
Int. Cl.² B01J 23/58
U.S. Cl. 252—473 4 Claims

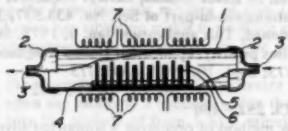
1. A catalyst comprising an inert unitary porous ceramic honeycomb having a layer of a first or intermediate coating of a high surface area catalytically active refractory metal oxide and a second layer deposited upon the first layer comprising a catalytically active material selected from the group consisting of $CaRuO_3$, $MgRuO_3$, $BaRuO_3$, $SrRuO_3$ and a mixture of MgO_2 and RuO_2 said second layer also including platinum.

3,972,838

COMPOSITION FOR DIFFUSING PHOSPHORUS

Mitsuo Yamashita, Tokyo; Akio Mikogami, Machida; Masashi Hasegawa, and Hiroshi Oizumi, both of Sagamihara, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 411,766, Nov. 1, 1973, Pat. No. 3,931,039.
This application May 13, 1975, Ser. No. 576,958
Int. Cl.² H01B 1/08
U.S. Cl. 252—518 2 Claims



1. A method for diffusing phosphorus wherein phosphorus diffusion is effected with a wafer comprising 30–95 percent by weight of phosphorus nitride and 70–5 percent by weight of silicon dioxide, in a stream of an inert gas saturated with water vapor having a temperature of 0°–30°C.

3,972,839

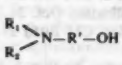
AMINE STRIPPING COMPOSITION AND METHOD

Donald P. Murphy, Madison Heights, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 324,278, Jan. 17, 1973, abandoned. This application July 8, 1974, Ser. No. 486,275
Int. Cl.² C11D 3/32; B08B 17/00
U.S. Cl. 252—548 6 Claims

1. A concentrate paint stripping composition consisting essentially of

a. 3–50 wt. % of an accelerator comprising an alkanol first amine of the formula:



wherein R′ is an alkyl group of up to about 4 carbon atoms and R_1 and R_2 are independently selected from the group consisting of hydrogen, alkyl groups of 1–4 carbon atoms, aryl groups of 6–7 carbon atoms and alkanol groups of 1–3 carbon atoms and a second different amine compound selected from the group consisting of monoethanolamine, diethanolamine, triethanolamine, melamine, 2-(2-aminoethoxy)ethanol, o-phenylene-diamine, 3-methoxy propylamine, phenyldiethanolamine and ethoxy ethoxy propylamine, wherein the mole ratio of the first amine to the second amine is between about 0.3 to 1 and

b. 50–97 wt. % of an alkaline material comprising an alkali metal hydroxide as a major portion thereof.

3,972,840

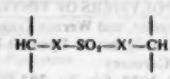
ION-EXCHANGEABLE AND SOLVENT-RESISTANT FILAMENTARY STRUCTURE CONTAINING SULFONE CROSS-LINKED AROMATIC UNITS

Hideaki Suzuki, Machida; Haruo Togawa, Koganei; Akira Omori, Sagamihara, and Naoki Yamamoto, Hino, all of Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 358,327, May 8, 1973, Pat. No. 3,927,968.
This application Dec. 9, 1974, Ser. No. 531,056
The portion of the term of this patent subsequent to Nov. 12, 1991, has been disclaimed.
Int. Cl.² C08G 75/20
U.S. Cl. 260—2.1 R 4 Claims

1. A solvent-resistant filamentary structure comprising at least 20 % by weight of aromatic nuclear structural units derived from an aromatic monovinyl monomer, 2 to 40 out of

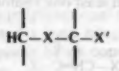
100 of said aromatic nuclear structural units being crosslinked by crosslinkages of the following formula (I)



(I)

wherein X and X′ are the same or different and each represent aromatic nuclear structural units derived from an aromatic monovinyl monomer which may have a substituent,

said filamentary structure not containing a crosslinkage expressed by the formula



wherein X is the same as defined above and X′ is the same as defined above or a hydrogen atom,

and the remainder of said aromatic nuclear structural units, either partly or wholly, having incorporated therein an ionexchangeable group.

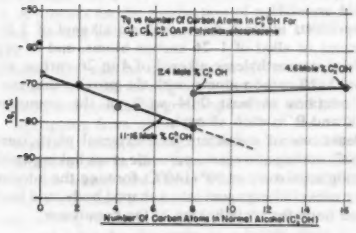
3,972,841
POLYPHOSPHAZENE ELASTOMER WITH UP TO 35 MOLE PER CENT NON-FLUORINATED ALKOXY GROUPS HAVING IMPROVED LOW TEMPERATURE FLEXIBILITY

Tai Chun Cheng, Akron; Gary S. Kyker, Uniontown, and Thomas A. Antkowiak, Rittman, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

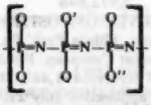
Filed Jan. 29, 1975, Ser. No. 544,976

Int. Cl.² C08G *73/00, 79/02*

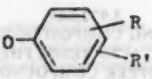
U.S. Cl. 260—2 P **4 Claims**



1. Phosphonitrilic fluoroelastomers represented by the following general formula:



in which each Q represents a fluoroalkoxy group represented by the formula $-OCH_2C_nF_{2n}Z$, in which Z is either F or H and n is an integer from 1 to 10 there being at least two different such fluoroalkoxy groups; each Q′ represents an alkoxy group with up to 16 carbon atoms, and there may be more than one such group in the polymer, the amount of Q′ present being sufficient to noticeably improve the low temperature physical properties of the polyphosphazenes, and each Q″ represents a group with some unsaturation which enhances the curability of said elastomer and represented by the formula



wherein R is an unsaturated monovalent group and R′ is selected from the group consisting of H, alkyl and alkoxy; and in which the relative proportions of Q″:Q′:Q is about 0.1–5 mole %: up to about 35 mole %: balance, the amount of Q′ present being sufficient to noticeably improve the low temperature physical properties of the polyphosphazenes.

3,972,842
RECLAMATION OF FLUOROPOLYMERS

John Lucien Markham, Birmingham, England, assignor to Dunlop Limited, London, England

Filed Apr. 22, 1974, Ser. No. 462,951

Claims priority, application United Kingdom, May 2, 1973, 20822/73

Int. Cl.² C08J *11/04;* **C08F** *214/22, 214/28, 214/26*

U.S. Cl. 260—2.3 **15 Claims**

1. A method of reclaiming a vinylidene fluoride fluoropolymer which has been cured using an organic polyhydroxy curative, which comprises masticating the fluoropolymer to at least the stage at which break-down of the cured polymer network is initiated, treating the masticated polymer with concentrated nitric acid at an elevated temperature to cause the polymer to swell, and subsequently removing the nitric acid from the swollen polymer.

3,972,843
EXPANDABLE STYRENE POLYMERS SUITABLE FOR THE PRODUCTION OF QUICKLY MOLDABLE CELLULAR BODIES

Rudolf de Jong, Marl, Germany, assignor to Chemische Werke Huls Aktiengesellschaft

Continuation of Ser. No. 408,424, Oct. 23, 1973, abandoned. This application Mar. 24, 1975, Ser. No. 561,195

Claims priority, application Germany, Nov. 11, 1972, 2255397

Int. Cl.² C08J *9/18, 9/20*

U.S. Cl. 260—2.5 B **15 Claims**

1. In a particulate molding composition for the production of foamed articles consisting essentially of a mixture of an expanding agent and a polymerized styrene monomer or styrene monomer in admixture with comonomers, the improvement comprising said composition containing 0.01 to 2.0 percent by weight based on said monomers and comonomers of a 1-butene polymer.

3,972,844
POWDER COATING COMPOSITION

Kaoru Morosawa; Iwao Maruyama; Shigemasa Kaneda, all of Tokyo; Mitsuo Nishimura, Nishinomiya; Kiyoshi Taki, Amagasaki, and Takeshi Kuninori, Sakai, all of Japan, assignors to Shinto Paint Co., Ltd., Amagasaki, Japan

Filed Aug. 6, 1974, Ser. No. 495,274

Claims priority, application Japan, Aug. 7, 1973, 48-88718

Int. Cl.² C08L *1/12, 1/14;* **C09J** *3/14*

U.S. Cl. 260—16 **4 Claims**

1. A colored or noncolored powder coating composition for specific pattern finishes obtained by kneading a mixture containing as main components (A) 100 parts by weight of a thermosetting polyester resin which is solid or powdery at the normal temperature and (B) 0.01 to 0.5 part by weight of a thermoplastic cellulose ester resin powder, under such a temperature condition that the component (A) is melted but the component (B) is not melted and cooling the mixture and then powdering the same.

3,972,845

AQUEOUS COATING COMPOSITIONS COMPRISING POLYCARBOXYLIC ACID RESIN, PHENOL RESIN AND COPPER COMPOUND

Norio Nikaido, and Mototaka Iihashi, both of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd., Japan

Filed Nov. 4, 1974, Ser. No. 520,857
Claims priority, application Japan, July 16, 1974, 49-81381
Int. Cl.² C09D 3/56
U.S. Cl. 260—19 UA 2 Claims

1. In an aqueous coating composition comprising an aqueous medium having dispersed therein an unsaturated polycarboxylic acid resin neutralized with a base and a phenol resol an improvement characterized in that said composition further contains a copper compound dispersed in the aqueous medium in an amount of 0.0005 to 5% by weight in terms of copper metal, based on said polycarboxylic acid resin, said polycarboxylic acid resin being at least one species selected from the group consisting of maleinized product of drying oil, polyester resin having at least one carboxyl group, maleinized reaction product of epoxy resin esters, alkyd resin modified with fatty acid and maleinized polybutadiene, and said copper compound being at least one species selected from the group consisting of copper naphthenate, copper benzoate, copper laurate, copper palmitate, copper stearate, copper oleate, copper abietinate, copper salt of maleinized oleic acid, copper salt of fumaric tung oil, copper hydroxides, copper oxides, copper sulfate, copper chlorides, copper phosphate, copper chromate and basic copper carbonate.

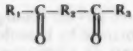
3,972,846

CURABLE URETHANE RESIN COMPOSITION COMPRISING A MIXTURE OF POLYISOCYANATE, ACTIVE HYDROGEN COMPOUND AND DIKETO COMPOUND

Atsuo Mori, Hirakata; Shuji Kitamura, Toyonaka, and Kohji Yamatsuta, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 30, 1974, Ser. No. 519,213
Claims priority, application Japan, Oct. 31, 1973, 48-123125
Int. Cl.² C08G 18/00
U.S. Cl. 260—30.4 N 6 Claims

1. A curable polyurethane composition consisting essentially of a keto compound and a liquid mixture of an organic aliphatic polyfunctional polyisocyanate and a compound having active hydrogen selected from the group consisting of water, polyhydric alcohols, amines and phenols, the keto compound having the general formula:



wherein R_1 and R_3 are each an alkyl group, an aromatic group, or a heterocyclic group, which may be the same or different, and R_2 is a lower alkylene or alkenyl group having 1 to 2 carbon atoms, and the amount of the keto compound being 0.001 to 1 weight part per 100 weight parts of said urethane composition.

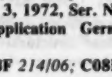
3,972,847

PROCESS FOR MAKING CROSS-LINKING SHAPED ARTICLES FROM COPOLYMERS OF VINYL CHLORIDE

Günther Bernhardt, Hangelar, and Werner Trautvetter, Troisdorf-Spich, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Cologne, Germany

Filed Nov. 3, 1972, Ser. No. 303,561
Claims priority, application Germany, Nov. 9, 1971, 2155560
Int. Cl.² C08F 214/06; C08K 5/12, 5/53
U.S. Cl. 260—30.6 R 11 Claims

1. Process for production of cross linked shaped bodies comprising admixing copolymer of 30 to 98 wt-% vinyl chloride and 2 to 70 wt-% of at least one comonomer of the formula



wherein Z is at least one of —COOR, —COOR′, —CH_2COOR, —OR, —CH_2OR, —OCOR and —CH_2OCOR′ and

a. when
Z = —COOR,
X = —COOR, and
Y = —H or —CH_3

b. when
Z = —COOR′ or —CH_2COOR
X = —H or —CH_3, and
Y = —H or —CH_3 or —CH_2COOR

c. when
Z = —OR or —CH_2OR
X = —H, and
Y = —H or —CH_3

d. when
Z = —OCOR,
X = —H, and
Y = —H

e. when
Z = —CH_2OCOR′,
X = —H, and
Y = —H or —CH_3

and R represents at least monoethylenic alkenyl of 3 to 26 carbon atoms or alkyl of 1–26 carbon atoms, and R′ represents at least monoethylenic alkenyl of 4 to 26 carbon atoms or alkyl of 1–26 carbon atoms, with the proviso that the copolymer contains at least 0.04 wt.% of the comonomer wherein R and R′ is each alkenyl,

with at least one of stabilizers, and external plasticizers at 120°–170°C, adding an organic peroxide cross linking agent to the resulting admixture at 90°–140°C, forming the admixture containing cross linking agent into a shaped body, and heating the shaped body for cross linking of the copolymer.

3,972,848

ADHESIVE COMPOSITION

Pallavoor R. Lakshmanan, Allison Park, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 471,467, May 20, 1974, Pat. No. 3,919,160. This application July 29, 1975, Ser. No. 599,989
Int. Cl.² C08K 5/07
U.S. Cl. 260—32.8 A 12 Claims

1. An adhesive composition consisting essentially of a styrene-butadiene radial block copolymer, a styrene-isoprene block copolymer, an isoprene-piperylene copolymer and an organic solvent wherein the components are present in the following ranges, assuming the presence of 100 parts by weight of the styrene-butadiene radial block copolymer in the final composition:

Component	Parts by Weight
Styrene-Isoprene Block Copolymer	5–300
Isoprene-Piperylene Copolymer	5–300
Solvent	50–4,000

, wherein the styrene-butadiene radial block copolymer has the following general configuration:

$(A-B)_xY,$

with A being a styrene polymer, B a butadiene polymer, Y a group derived from a polyfunctional compound having at least three reactive sites and x is an integer ranging from three to five; the styrene-isoprene block copolymer has the following general configuration:

$$A_1-B_1-A_1,$$

wherein A_1 is a styrene polymer block having an average molecular weight of about 2000 to about 100,000 and B_1 is an isoprene polymer block having an average molecular weight of 25,000 to about 1,000,000; and the melting points of the isoprene-piperylene copolymer being in the range of about 70° to about 130°C.

3,972,849

PRODUCTION OF RESINS

Hilmar Bruenemann, Ludwigshafen; Guenter Stoeckelmann, and Volker Radtke, both of Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Apr. 3, 1974, Ser. No. 457,409

Claims priority, application Germany, May 5, 1973, 2322741

Int. Cl.² C08J 3/12

U.S. Cl. 260—37 P 8 Claims

1. A process for the production of particulate milled resins having melting points of more than about 100°C which comprises:

passing the reaction components of the resin into a moving reaction vessel having an outlet for volatile reaction by-products containing grinding bodies, said grinding bodies occupying from about 20 to 60% of the volume of the reaction vessel, heating said components to their reaction temperature in the presence of said moving grinding bodies within said vessel whereby a liquid film of reactants is formed on the surface of said bodies;

and cooling the formed resin while continuing to move said vessel whereby the resin in a brittle state is caused to break away from said bodies and be milled by said bodies, the ratio of the amount of the resin components (M) in grams to the surface area (O) of the grinding bodies in square centimeters conforms to the relationship:

$$(M/O) \leq (1/5)d$$

d being the mean diameter of a grinding body in centimeters.

3,972,850

HYDROPHOBIC WINDSHIELD WIPERS AND PROCESS FOR MAKING SAME

Wilson S. Hamilton, Bellevue; Malcolm T. Katsumato, Mercer Island; James M. Lea, Seattle, and George E. Trepus, Enumclaw, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 287,452, Sept. 8, 1972, abandoned. This application Nov. 13, 1974, Ser. No. 523,382

Int. Cl.² C08L 83/04

U.S. Cl. 260—37 SB 7 Claims

1. A windshield wiper blade capable of imparting hydrophobic characteristics to a windshield against which it operates comprising: a dimethylsiloxane and a siloxane containing a functional group with said siloxane selected from a group consisting essentially of vinylmethylsiloxane, phenylmethylsiloxane, and trifluoropropylmethylsiloxane as an elastomeric copolymer; a filler selected from the group consisting essentially of silica, mica, molybdenum disulfide, and tetra fluoro ethylene dispersed throughout the copolymer in amounts of about 3 to 20 parts per hundred based on the copolymer; and about .2 to 10 parts per hundred of an additive dispersed through the copolymer, said additive selected from the group of materials consisting essentially of dicoco dimethyl ammonium chloride, and an acetate salt of a copolymer of the formula

$$\left[HO-\left(\begin{matrix}(CH_3)_2\\ |\\ SiO\end{matrix}\right)_X\right]_2 \begin{matrix}CH_2\\ |\\ Si(CH_3)_2NHCH_2CH_2NH_2,\end{matrix}$$

and X has a total value of from 10 to 400 inclusive.

3,972,851

PREPARATION OF POLYPHENYLENE OXIDE USING A MANGANESE(II) ORTHO-HYDROXYARENE-OXIME CHELATE REACTION PROMOTER

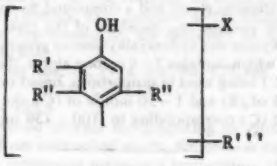
Walter K. Olander, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed July 24, 1974, Ser. No. 491,475

Int. Cl.² C08G 65/44

U.S. Cl. 260—47 ET 18 Claims

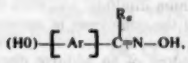
1. A process of forming self-condensation products of a phenol having the structural formula:



where X is a substituent selected from the group consisting of hydrogen, chlorine, bromine, and iodine; R' is a monovalent constituent selected from the group consisting of hydrogen, hydrocarbon radicals, halohydrocarbon radicals having at least two carbon atoms between the halogen atoms and phenol nucleus, hydrocarbonoxy radicals, and halohydrocarbonoxy radicals having at least two carbon atoms between the halogen atoms and phenol nucleus, R'' and R''' being the same as R' and, in addition, halogen, under reaction conditions which comprise contacting said phenol with oxygen in a basic reaction medium and in the presence of a manganese chelate complex of the formula:

$(L)_2Mn$,

wherein L is an ortho-hydroxyareneoxime ligand of the formula:



wherein independently R_a is selected from the group consisting of hydrogen and lower alkyl radicals having from one to five carbon atoms, Ar is at least a divalent arene radical having at least —OH radical and at least one

radical attached directly to an ortho positioned arene ring carbon atom, and x is a positive number at least equal to about 1.

3,972,852

PROCESS FOR PREPARING AROMATIC POLYESTERS FROM DIPHENOLS

Hiroo Inata; Shoji Kawase, and Takeo Shima, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Aug. 5, 1974, Ser. No. 494,870

Claims priority, application Japan, Aug. 7, 1973, 48-87982; June 21, 1974, 49-70117; June 22, 1974, 49-70796; May 25, 1974, 49-58414; May 27, 1974, 49-57791

Int. Cl.² C08G *63/18, 63/26*

U.S. Cl. 260—47 C **10 Claims**

1. In a process of preparing linear aromatic polyesters by reacting in a molten state (A) a member selected from the group consisting of aromatic dicarboxylic acids and lower alkyl esters and aryl esters thereof with (B) a diphenol to prepare a polymer and thereafter polymerizing the thus obtained polymer in the solid phase, the improvement which comprises carrying out said reaction in the presence of (C) at least one member selected from the group consisting of the dihydroxy compounds, bisglycol esters of dicarboxylic acids and glycol esters of hydroxycarboxylic acids, said dihydroxy compound selected from the group consisting of a straight chain or branched chain aliphatic glycol of 2 – 12 carbon atoms, an alicyclic glycol and a compound having attached to its aromatic nucleus two members of the class consisting of hydroxyalkylene and hydroxyalkyleneoxy groups, the alkylene portion of which contains 2 – 6 carbon atoms, the components (B) and (C) being used in proportions, based on (A), of 70 – 105 mol % of (B) and 1 – 50 mol % of (C), the total amount of (B) and (C) corresponding to 100 – 130 mol % of (A).

3,972,853

PROCESS FOR STABILIZING LUBRICATING OIL WITH ELEMENTAL SULFUR

Robert L. Gorring, Washington Crossing, Pa.; Eric J. Y. Scott, Princeton, and Robert L. Smith, Hopewell, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 8, 1974, Ser. No. 495,591

Int. Cl.² C10M *1/12*

U.S. Cl. 252—45 **5 Claims**

1. A process for forming a stablized lubricating oil resistant to oxidation and sludge formation upon exposure to an oxidative environment which comprises contacting a hydrocarbon lubricating oil stock having a boiling range above about 600°F with elemental sulfur in amount of from about 0.1 to about 0.5 percent by weight of said oil stock at a reaction temperature of between about 25°C and about 70°C and reaction pressure of from about 0 psig to about 100 psig for a reaction period of at least 2 hours and, washing the oil from said contacting step to remove any unreacted sulfur therefrom.

3,972,854

COLOR CONTROL OF POLYPROPYLENE

John J. Costolow, Pasadena, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 3, 1975, Ser. No. 554,528

Int. Cl.² C08J *3/20*

U.S. Cl. 260—23 H **11 Claims**

1. A process for controlling the tristimulus color value of A, B and L of a fiber-grade composition of polypropylene wherein the tristimulus color value A is maintained in the range of −14 to −10; the tristimulus color value of B is maintained in the range of +13 to +16; while the tristimulus color value of L is maintained in the range of +50 to +60; and wherein said composition consists essentially of polypropylene and a stabilizing amount of an antioxidant additive system which comprises compounding said composition in a compounding zone wherein the atmosphere thereof has an oxygen content in the range of 0.1 to 5.0 volume percent.

3,972,855

QUATERNARY AMMONIUM COMPOUNDS AND TREATMENT OF PLASTIC AND OTHER MATERIALS THEREWITH

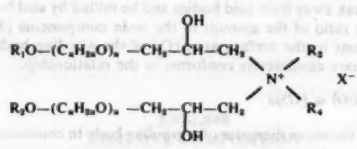
Eva Margareta Martinsson, Stenungsund, and Karl Martin Edvin Hellsten, Odsmal, both of Sweden, assignors to Modokemi Aktiebolag, Stenungsund, Sweden

Continuation-in-part of Ser. No. 306,251, Nov. 10, 1972, abandoned. This application Dec. 10, 1973, Ser. No. 423,592

Int. Cl.² C07C *93/04*

U.S. Cl. 260—567.6 M **6 Claims**

1. Quaternary ammonium compounds capable of imparting excellent antistatic properties to a substrate, having the general formula:



wherein:

R_1 and R_3 are aliphatic hydrocarbon groups, having from about eight to about 22 carbon atoms;

R_2 and R_4 are methyl, ethyl or hydroxyethyl;

n is a number from 2 to 4, representing the number of carbon atoms in the oxyalkylene substituent;

n_1 and n_2 are numbers within the range from 0.5 to about 10, representing the number of oxyalkylene groups present in each substituent; and represent average values; and

X is an anion selected from the group consisting of chloride, bromide, iodide, nitrate, hydroxyl, phosphate, methyl sulfate, formate acetate, proprionate citrate and tartarate.

3,972,856

POLYURETHANES CONTAINING POLY(PERFLUOROALKYLENE OXIDES) UNITS

Ronald A. Mitsch, Village of Little Canada, and Joseph La Mar Zollinger, Village of Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. Nos. 805,885, March 10, 1969, abandoned, and Ser. No. 70,540, Sept. 8, 1970, Pat. No. 3,810,874. This application Oct. 3, 1973, Ser. No. 403,199
The portion of the term of this patent subsequent to May 14, 1991, has been disclaimed.
Int. Cl.² C08G 18/30, 18/48
U.S. Cl. 260—77.5 AP 21 Claims

1. Polyurethane having a glass transition temperature lower than −78°C. and comprising urethane linkages and backbone units of the formula

$$-CF_2O-(CF_2CF_2O)_m(CF_2O)_n-CF_2-$$

where *m* and *n* designate randomly distributed perfluoroethyleneoxy and perfluoromethyleneoxy backbone subunits, respectively, the ratio *m*/*n* being 0.2/1 to 5/1.

3,972,857

SULFUR VULCANIZABLE ETHYLENE-VINYL ACETATE COPOLYMER ELASTOMERS

Samuel Kaizerman, Bridgewater Township, Somerset County, and Robert Saxon, Princeton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 8, 1975, Ser. No. 575,844
Int. Cl.² C08F 28/02, 216/14, 218/08
U.S. Cl. 260—79.5 C 5 Claims

1. A copolymer comprising: (a) from about 35–80 weight percent ethylene, (b) a vinyl monomer represented by the formula

$$CH_2{=}CH{-}O{-}\overset{\overset{O}{\|}}{C}{-}R\,,$$

where R is a lower alkyl group containing at least one chlorine or bromine atom on a carbon atom alpha to the carbonyl group, or $CH_2{=}CH\text{-}O\text{-}R'$, where R' is ethyl, propyl or butyl containing at least one chlorine or bromine atom on a carbon atom beta to the ether oxygen; said monomer being present in an amount sufficient to provide between 0.2 and 4.5 weight percent of chlorine and/or bromine in said copolymer, and (c) the remainder of said copolymer being vinyl acetate.

4. The product of reaction of a copolymer of ethylene and vinyl acetate with chloroacetic acid; said reaction product being a copolymer containing about 35–80 weight percent combined ethylene, about 0.2–2 weight percent of combined chlorine in the form of vinyl chloroacetate, the remainder of said product copolymer being combined vinyl acetate.

3,972,858

PROCESS FOR THE PREPARATION OF CHOLERAGEN

Joseph Stärk, Marburg an der Lahn, and Oswald Zwisler, Marbach near Marburg an der Lahn, both of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn

Filed Dec. 19, 1974, Ser. No. 534,278
Claims priority, application Germany, Dec. 22, 1973, 2364317
Int. Cl.² A61K 39/02; C07G 7/00
U.S. Cl. 260—112R 12Claims

1.Aprocess for preparing choleragen, which comprises adding silicic acid to a solution containing choleragen, stirring the suspension, separating the silicic acid, treating for elution with an aqueous salt or buffer solution, and separating the choleragen-containing eluate from the silicic acid.

3,972,859

NOVEL DECAPEPTIDE AMIDE ANALOGS OF LEUTEINIZING HORMONE-RELEASNG HORMONE

Masahiko Fujino, Takarazuka; Susumu Shinagawa, Osaka, and Tsunehiko Fukuda, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 4, 1975, Ser. No. 555,126
Claims priority, application Japan, Mar. 8, 1974, 49-27442
Int. Cl.² C07C 103/52; A61K 37/00
U.S. Cl. 260—112.5 LH 14 Claims

1. A compound of the formula

$$(Pyr)Glu\text{-}His\text{-}Trp\text{-}Ser\text{-}R_1\text{-}R_2\text{-}R_3\text{-}Arg\text{-}Pro\text{-}Gly\text{-}NH_2$$

wherein R_1 is Tyr or Phe; R_2 is D-Nle, D-Nva, D-Abu, D-Phe, D-Ser, D-Thr or D-Met and R_3 is Leu, Ile or Nle.

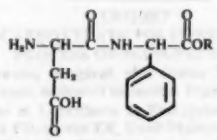
3,972,860

L-ASPARTYL-L-PHENYLGLYCNE ESTERS OF LOWER ALKANOLS

Carole L. Moriarty, 359 Huntington Ave., Buffalo, N.Y. 14212, and George L. Tritsch, 168 Lexington Ave., Buffalo, N.Y. 14222

Filed Sept. 2, 1969, Ser. No. 854,786
Int. Cl.² C07C 103/52; A23L 1/22
U.S. Cl. 260—112.5 R 2 Claims

1. A dipeptide of the formula:



wherein each amino acid is in the L-configuration and R is lower alkyl.

3,972,861

PROCESS FOR PRODUCING AN EDIBLE COTTONSEED PROTEIN CONCENTRATE

Homer K. Gardner, Jr., Metairie; Robert J. Hron, Sr., New Orleans; Henry L. E. Vix, Metairie, all of La., and Jim M. Ridlehuber, Lubbock, Tex., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 26, 1974, Ser. No. 527,398
Int. Cl.² A23J 1/14
U.S. Cl. 260—123.5 6 Claims

1. An improved process for producing an edible protein concentrate from cottonseed meats, the process comprising:

a. drying the cottonseed meats at a temperature of 180°F or less, to a moisture content of 2.5 percent or less,
b. cooling the dried cottonseed meats to ambient temperature,
c. comminuting (milling) the cooled meats in a wide chamber pin mill to prevent pigment gland and premature oil cell rupture, said pin mill having two contra-rotating discs of about 11 inches diameter, ¼ inch pins of cylindrical configuration, operating separately from the mill side at about 9500 rpm and from the door side at about 2500 rpm,
d. adding a nonpolar hydrocarbon solvent to the milled meats and mixing thoroughly to produce a uniform slurry which contains about from 17 to 25 percent solids, by weight,
e. feeding the uniform slurry into a liquid cyclone at a pressure of about from 35 to 45 pounds per square inch, said liquid cyclone being adjustable by inclusion of a variable speed positive displacement underflow pump, to produce an overflow to underflow stream ratio in the range of about from 1:1 to 1:9, respectively, said range being about from 10 to 15 percent solids content by weight with respect to overflow and about from 30 to 45 percent solids with respect to

underflow, the said underflow stream containing the pigment gland-gossypol, large meal and hull particles, thus exiting the process for meal, oil, and solvent recovery, the overflow portion being retained for further processing,

f. feeding the overflowstream portion as it emanates out of the upper outlet of the cyclone to a rotary vacuum filter where the miscella is separated from the solids, said solids thus forming a cake, and vashing this cake with overflow feed slurry to prevent cake-cracking, thus obtaining sufficient oil removal in the following step,

g. washing the cake further with non-polar solvent to obtain an essentially oil-free solvent-wet solid material with a solids content of about from 60 to 65 percent by weight, and

h. removing the residual solvent from the solid material of step (g) by volatilizing at a temperature of about 200°F to produce a consistently edible flour product containing not more than 60 ppm of solvent and having a protein content of about 65 percent, a free gossypol content of 0.045 percent or less, an oil content of less than about 1 percent, and an overall recovery of initial solids of about 46 percent, all percentages being by weight.

3,972,862

STEREOREGULATED COPOLYMERS OF BUTADIENE AND PIPERYLENE

Erik G. M. Tornqvist, 38 Mareu Drive, Scotch Plains, N.J. 07076, and Albert M. Gessler, 448 Orchard St., Cranford, N.J. 07016

Filed July 22, 1974, Ser. No. 490,284
Int. Cl.² C08F *4/64, 4/66, 236/20*
U.S. Cl. 526—337 **6 Claims**

1. Process for the production of a copolymer of 1,3-butadiene and piperylene characterized by a random distribution of monomer units in the polymer chain; vinyl unsaturation pendant to the main polymer chain which is equal to or less than 10 percent of the total unsaturation present in the polymer; enchainment of at least 95 percent of the piperylene in a 1,2-trans and 1,4-trans-stereoisomeric configuration; and selective enchainment of between about 50 and 95 percent of the butadiene monomer units in the 1,4-trans-stereoisomeric configuration; which comprises reacting a mixture of butadiene and piperylene in a solvent, said piperylene having a trans-stereoisomer content in the range of 50 to 100 percent, in the presence of an iodinecontaining catalyst system comprising TiX_n-xMI_n-yI_2-$zAlR_3$-QLB wherein X is a halogen independently selected from the group consisting of chlorine, bromine and iodine; M is a metal from Groups IIIa and IVa of the Periodic Table of the Elements; R is a monovalent hydrocarbon radical selected from the group consisting of C_1 to C_{12} alkyl, aryl, alkyl-aryl, arylalkyl and cycloalkyl radicals; LB is a Lewis Base, said Lewis Base being a thia heterocyclic compound selected from the group consisting of thiolane, tetrahydrothiapyran and alkyl substituted derivatives thereof or an oxa heterocyclic compound selected from the group consisting of tetrahydrofurans, tetrahydropyrans and alkyl substituted derivatives thereof; *n* is a number from 2 to 4; *x* has a numerical value of from 0 to 20; *y* has a numerical value of from 0 to 5; *z* has a numerical value of from 1 to 40; and Q has a numerical value of from 5 to 500; and isolating the copolymer from the solvent and catalyst.

3,972,863

METHOD FOR PREPARING COPOLYMERS FROM CONJUGATED DIENES AND MONOVINYLAROMATIC COMPOUNDS WITH RANDOM DISTRIBUTION OF MONOMER UNITS

Gennady Nikolaevich Petrov, Zheleznodorozhny pereulok, 7, kv. 35; Gennady Mikhailovich Tolstopyatov, Bulvar Novatorov, 88, kv. 146; Sergei Mikhailovich Krasilnikov, Petrovskaya ulitsa, 1/2, kv. 109; Nikolai Alexandrovich Juzhakov, prospekt Veteranov, 99, kv. 129; Tatyana Alexeevna Kornilova, Tallinskoe shosse, 48, kv. 55; Svetlana Mikhailovna Lashova, Novo-Izmailovsky prospekt, 69, kv. 94, all of Leningrad; Valentin Pavlovich Shatalov, ulitsa Geroev Stratosfery, 1, kv. 4, Voronezh; Leonid Vasilievich Kovtunenko, Leninsky prospekt, 13, kv. 46, Voronezh; Alexandr Julievich Shteinbok, Rostovskaya ulitsa, 46/6, kv. 71, Voronezh; Elena Yakovlevna Mandelshtam, prospekt Mira, 72, kv. 2, Moscow, and Boris Sergeevich Korotkevich, Fortunatovskaya ulitsa, 31/35, kv. 71, both of Moscow, all of U.S.S.R.

Filed Mar. 5, 1974, Ser. No. 448,259
Claims priority, application U.S.S.R., Mar. 5, 1973, 1887246
Int. Cl.² C08F *236/10*
U.S. Cl. 526—340 **18 Claims**

1. A method of preparing copolymers of conjugated diene monomers and monovinylaromatic monomers having a random distribution of monomer units which comprises copolymerizing said monomers in the presence of metallic lithium in granules as catalyst, and a modifying additive soluble in the reaction medium, said additive being the reaction product of a compound selected from the group consisting of potassium carbonate, potassium acetate, potassium hydroxide, sodium carbonate, sodium acetate and sodium hydroxide with an organoaluminum compound of the formula $AlR_m'R_n''$, in which R′ is selected from the group consisting of alkyl, aryl and aralkyl radicals, and radicals of the formula —OR‴, —SR‴, NR_2''';

R″ is selected from the group consisting of alkoxy and aryloxy radicals;

R‴ is selected from the group consisting of alkyl, aryl, aralkyl radicals and hydrogen;

m and *n* are integers from 0 to 3, inclusive, for the reaction product of said organoaluminum compound with said carbonates and acetates;

m are integers from 0 to 2, inclusive, and *n* are integers from 1 to 3, inclusive, for the reaction product of said organoaluminum compound with said hydroxides wherein the ratio of g-atoms of aluminum to 1 g-atom of sodium or potassium is from 2 to 20, said modifying additive being taken in an amount which corresponds to 1.10^{-5} to 2.10^{-1} g-atoms of aluminum per 100 g of said copolymerizing monomers; and said copolymerization being effected in solution in a liquid hydrocarbon solvent which is inert to the initial components.

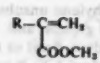
3,972,864

COPOLYMERS OF METHYL α-N-ALKYLACRYLATE AND METHYL METHACRYLATE

Henry Gisser, Philadelphia, and Helen E. Mertwoy, Dresher, both of Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 19, 1975, Ser. No. 551,185
Int. Cl.² C08F *220/10, 220/14*
U.S. Cl. 526—328 **6 Claims**

1. A method for the copolymerization of methyl methacrylate and methyl α-n-alkylacrylate, said methyl α-n-alkylacrylate having the formula



where R is an alkyl having the formula $C_nH_{2n}{}^+{}_1$ where n is at least 10 and not greater than 22, the mole ratio of the reactants methyl methacrylate to methyl α-n-alkylacrylate being in the range from 1:1 to 1:2, and comprising the steps of:

preparing a pure, isomer free, methyl α-n-alkylacrylate; adding said methyl methacrylate and a catalyst selected from the group consisting of azobisisobutyronitrile and benzoyl peroxide to said methyl α-n-alkylacrylate to form a mixture; and heating said mixture at about 50°C in an oxygen free and moisture free atmosphere until polymerization of the reactants is completed.

4. Copolymers, which are reaction products of the free radical copolymerization of methyl methacrylate and methyl α-n-alkylacrylate, said methyl α-n-alkylacrylate having the formula

wherein R is an alkyl having the formula C_nH_{2n+1} where n is at least 10 and not greater than 22, the mole ratio of methyl methacrylate to methyl α-n-alkylacrylate in said free radical copolymers being in the range from 3:1 to 46:54, said free radical copolymers having an average molecular weight of from 9,980 to 16,600, said average molecular weight being conveniently determined by vapor pressure osmometry.

3,972,865
FINELY DIVIDED SAPONIFIED ETHYLENE-VINYL ACETATE INTERPOLYMERS

Dorothee M. McClain, Cincinnati, Ohio, and Betty L. Vest, Covington, Ky., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Apr. 1, 1975, Ser. No. 564,199
Int. Cl.² C08F 8/12
U.S. Cl. 526—14 **11 Claims**

1. A process for the simultaneous hydrolysis and dispersion of an ethylene-vinyl acetate interpolymer into a finely divided form which comprises

a. subjecting a mixture of said interpolymer in molten form and water to vigorous agitation at a temperature below the degradation temperature of said interpolymer in the presence of a water-soluble block copolymer of ethylene oxide and propylene oxide having a molecular weight above about 2900 and containing at least 30% by weight of ethylene oxide and in the presence of a catalytic amount of a strong acid hydrolysis agent; and

b. cooling the resulting dispersion to below the softening temperature of the resulting saponified finely divided interpolymer.

3,972,866
POLYMERIZATION PROCESS

Michael Stanley Fortuin, St. Albans, andAnthony David Caunt, Welwyn Garden City, both of England, assignors to Imperial Chemical Industries Limited, London, England

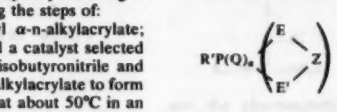
Continuation-in-part of Ser. No. 367,006, June 4, 1973. This application Nov. 16, 1973, Ser. No. 416,495
Claims priority, application United Kingdom, June 9, 1972, 27008/72; June 9, 1972, 27009/72; July 7, 1972, 31884/72; Feb. 19, 1973, 7985/73; Feb. 19, 1973, 7986/73
Int. Cl.² C08F 4/66, 10/06
U.S. Cl. 526—77 **23 Claims**

1. An olefine polymerisation catalyst comprising

1. a solid halide or oxyhalide compound of a transition metal wherein the said metal has a valency below its maximum,

2. an organo-metallic compound of aluminium, or of a non-transition metal of Group II of the Periodic System, or a complex of an organo-metallic compound of a non-transition metal of Group I or II of the Periodic System, and an organo-aluminium compound; and

3. at least one phosphorus compound selected from materials of the formula



wherein

R′ is a halogen, a hydrocarbyl group, a group —NR‴₂ or —OR‴, a heterocyclic group or a group (E—Z—G);

R‴ is a hydrocarbyl group;

each E is —O—, —S— or —NR‴— and may be the same or different;

E′ is —S— or —NR‴—;

G is —OR‴, —SR‴, —NR‴₂, —PR‴₂ or a heterocyclic ring system whereof the heteroatom is O, S, N or P;

Q is an oxygen or sulphur atom;

Z is a bivalent hydrocarbyl radical such that E and G, or E and E′ are separated by not more than 3 carbon atoms; and

a is zero or one.

3,972,867
CYANOCARBOXYLATE POLYMERS AND THEIR PROCESS OF MANUFACTURE

Francois Dawans, Bougival, and Denise Nicolas, Maurepas, both of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf, Rueil-Malmaison, France

Filed Mar. 27, 1975, Ser. No. 562,929
Claims priority, application France, Mar. 29, 1974, 74.11257
Int. Cl.² C08C 19/22; C08F 8/30
U.S. Cl. 526—14 **13 Claims**

1. A modified polymer containing β-cyanocarboxylic groups added to double bonds of a polymer of conjugated diolefin, said modified polymer being obtained by the additional reaction of one or more β-cyanocarboxyl ic compounds of the formula:

wherein each of the radicals R and R′ represents a hydrogen atom or an alkyl, cycloalkyl, aryl or acyl group of 1–12 carbon atoms, or the radical R is a COOR′ group or halogen with polybutadiene, polyisoprene or polypentadiene, or with a copolymer of (a) butadiene, isoprene or pentadiene and (b) styrene, acrylonitrile or methyl methacrylate.

3,972,868
METHOD FOR SELECTIVELY GUIDING AND LIMITING THE REACTIONS OF HYDROXYL COMPOUNDS

Eero Sakari Avela, Helsinki, Finland, assignor to Suomen Sokeri Osakeyhtio, Helsinki, Finland

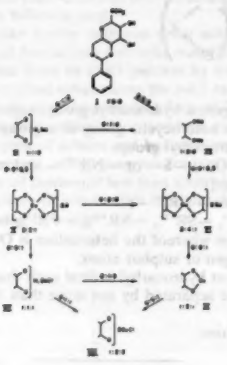
Filed July 19, 1972, Ser. No. 273,122
Int. Cl.² C07H 15/00, 15/02; C07C 43/20
U.S. Cl. 536—18 **17 Claims**

1. A process for producing derivatives of hydroxyl compounds which have at least two hydroxyl groups or a hydroxyl group and at least one additional functional group, which is capable of forming polyvalent metal complexes, which comprises:

a. forming a metal complex by reacting said hydroxyl or functional groups with a polyvalent metal compound, said

reaction occurring in completely anhydrous conditions to form a metal complexed compound;

b. subjecting the metal complexed compound to one or more further reactions selected from the group consisting of substitutions, addition, elimination, oxidation and reduction, which are selectively guided or limited by the



presence of said metal complex, which acts either as a blocking group or as a guiding group, said further reactions also occurring in completely anhydrous conditions; and

c. removing the metal complex to provide the desired reaction product.

3,972,869

PENICILLINS

Hans-Bodo Konig; Wilfried Schrock, and Karl-Georg Metzger, all of Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

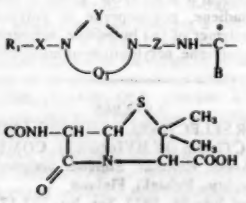
Continuation-in-part of Ser. Nos. 299,264, Oct. 20, 1972, abandoned, and Ser. No. 300,776, Oct. 20, 1972, abandoned. This application Sept. 3, 1974, Ser. No. 502,765

Claims priority, application Germany, Oct. 23, 1971, 2152967; Oct. 23, 1971, 2152968

Int. Cl.² C07D 499/46

U.S. Cl. 260—239.1 **30 Claims**

1. A compound selected from the group consisting of a penicillin of the formula



wherein the carbon atom designated by * constitutes a center of chirality;

X is —CO—, —CS— or —SO_2—;

each of Y and Z, independently of the other, is —CO— or —CS—;

B is thienyl, cyclohexenyl, cyclohexa-1,4-dien-1-yl, phenyl or phenyl substituted by one or two members selected from the group consisting of halo, nitro, hydroxy, methoxy, methylthio and alkyl of 1 to 5 carbon atoms;

Q_1 is ethylene or trimethylene unsubstituted or substituted by one or two methul groups; and

R_1 is pyrrolidino, piperidino, furyl or thienyl, unsubstituted or substituted by alkyl of 1 to 5 carbon atoms, and the pharmaceutically acceptable salts thereof.

3,972,870

PENICILLINS

Hans-Bodo Konig; Wilfried Schrock, and Karl-Georg Metzger, all of Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

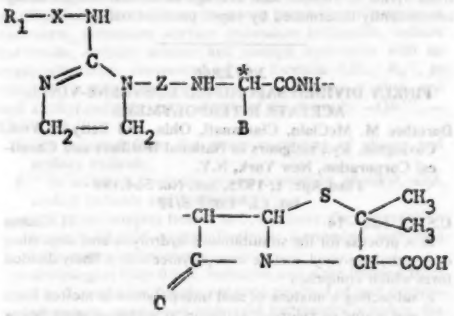
Continuation-in-part of Ser. Nos. 299,264, Oct. 20, 1972, abandoned, and Ser. No. 300,776, Oct. 20, 1972, abandoned. This application Sept. 3, 1974, Ser. No. 502,835

Claims priority, application Germany, Oct. 23, 1971, 2152967; Oct. 23, 1971, 2152968

Int. Cl.² C07D 499/46

U.S. Cl. 260—239.1 **14 Claims**

1. A compound selected from the group consisting of a penicillin of the formula



wherein the carbon atom designated by * constitutes a center of chirality;

X is —CO—, —CS— or —SO_2— Z is —CO— or —CS—;

B is thienyl cyclohexenyl, cyclohexa-1,4-dien-1-yl, phenyl or phenyl substituted by one or two members selected fromm the group consisting of halo, nitro, hydroxy, methoxy, methylthio and alkyl of 1 to 5 carbon atoms; and

R_1 is alkyl of 1 to 10 carbon atoms, phenyl or phenyl substituted by alkyl of 1 to 5 carbon atoms,

and the pharmaceutically acceptable salts thereof.

3,972,871

6β,17-DIHYDROXY-7α-(LOWER ALKOXY)CARBONYL-3-OXO-17α-PREGN-4-ENE-21-CARBOXYLIC ACID γ-LACTONES AND CONGENERS

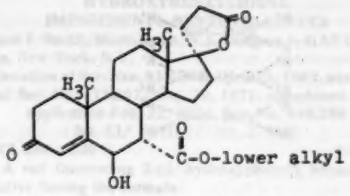
Aziz Karim, Niles, Ill.; William J. Marsheck, Harbor Beach, Mich., and Richard M. Weier, Deerfield, Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Sept. 22, 1975, Ser. No. 615,412

Int. Cl.² C07J 19/00

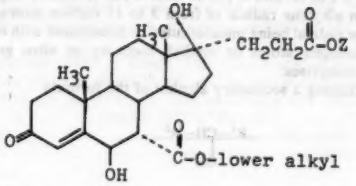
U.S. Cl. 260—239.57 **9 Claims**

1. A compound of the general formula



(I)

or



(II)

wherein the lower alkyl group contains 1 to 7 carbon atoms, and Z represents hydrogen, alkali metal, or alkaline-earth metal/2.

3,972,872

6-[α-(ω-GUANIDINOALKANOYLAMIDO)ACYLAMIDO]-PENICILLANIC ACIDS

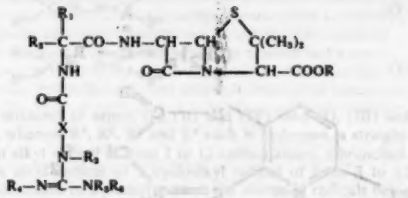
Ernest S. Hamanaka, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 508,070, Sept. 23, 1974, Pat. No. 3,933,797, which is a division of Ser. No. 228,344, Feb. 22, 1972, Pat. No. 3,870,709. This application May 6, 1975, Ser. No. 575,072

Int. Cl.² C07D *499/68, 499/70*

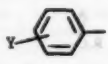
U.S. Cl. 260—239.1 **8 Claims**

1. A compound of the formula



and the pharmaceutically acceptable acid addition salts thereof wherein R is selected from the group consisting of hydrogen and acyloxy lower alkyl wherein acyloxy is selected from the group consisting of lower alkanoyloxy, benxoyloxy and substituted benzoyloxy wherein the substituent is selected from the group consisting of chloro, bromo, fluoro, lower alkyl, lower alkoxy and trifluoromethyl;

R_1 is selected from the group consisting of hydrogen, alkyl of from 1 to 14 carbon atoms, cycloalkyl of from 3 to 6 carbon atoms, 1,4-cyclohexadienyl, naphthyl, benzyl, phenethyl, furyl, thienyl, and



wherein Y is selected from the group consisting of hydrogen, nitro, di(lower alkyl)amino, lower alkanoylamino, lower alkyl, lower alkoxy, hydroxy, sulfamyl, chloro, bromo, fluoro, iodo, and trifluoromethyl;

R_2 is selected from the group consisting of hydrogen and lower alkyl;

R_1 and R_3 when taken together with the carbon atom to which they are attached are cycloalkylidene of 3 to 10 carbon atoms;

each of R_5 and R_6 is selected from the group consisting of hydrogen, lower alkyl, benzyl, and phenyl;

R_4 and R_5 when taken together with the guanyl moiety to which they are attached from a 6-membered heterocyclic ring selected from the group consisting of 2-(1,4,5,6-tetrahydropyrimidinyl) and 2-pyrimidinyl and

X is selected from the group consisting of alkylene having from 1 to 7 carbon atoms, phenylene, cycloalkylene having from 3 to 9 carbon atoms, propenylene whose $-CH_2$ group is bound to the adjacent nitrogen; vinylenephenylene, methylene oxyphenylene and phenylenemethylene, each of whose phenylene group is bound to the adjacent nitrogen.

3,972,873

CERTAIN PYRIDO[3,2-e][1,4-DIAZEPINONES AND DERIVATIVES

Walter von Bebenburg, Buchschlag, and Heribert Offermanns, Grossauheim, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Continuation-in-part of Ser. No. 468,088, May 8, 1974, Pat. No. 3,900,466. This application May 9, 1975, Ser. No. 576,112

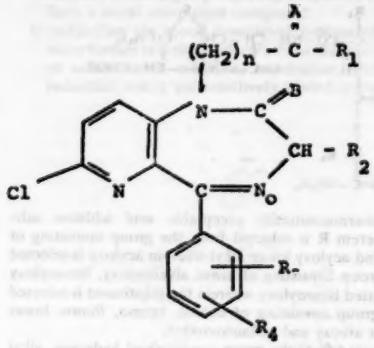
Claims priority, application Austria, May 25, 1973, 4628/73

The portion of the term of this patent subsequent to Aug. 19, 1992, has been disclaimed.

Int. Cl.² C07D *471/04*

U.S. Cl. 260—239.3 B **25 Claims**

1. A compound of the formula:



I

wherein:

n is an integer from 1 to 4;

is (a)

where R_1 is alkyl of 1 to 6 carbon atoms, (b) —CN, or (c)

B is oxygen;

R_2 is hydrogen or hydroxyl;

N_o is nitrogen or an N-oxide group;

R_3 is hydrogen or chlorine;

R_4 is hydrogen;

the tautomeric forms thereof and pharmaceutically acceptable salts thereof.

3,972,874

METHOD FOR PREPARING SYMMETRICAL AND UNSYMMETRICAL KETAZINES AND MIXTURES THEREOF

Henri Mathais, Sainte Foy les Lyon; Jean-Pierre Schirmann, Brignais, and Francis Weiss, Pierre-Benite, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

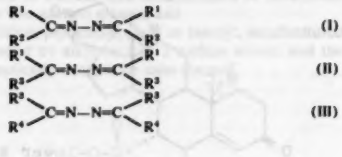
Continuation of Ser. No. 230,038, Feb. 28, 1972, abandoned. This application Dec. 9, 1974, Ser. No. 531,058

Claims priority, application France, Mar. 11, 1971, 71.08509

Int. Cl.² C07C *109/00*

U.S. Cl. 260—240 G **15 Claims**

1. A method for preparing symmetrical ketazines of the formula

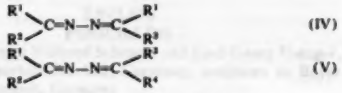


(I)

(II)

(III)

and unsymmetrical ketazines of the formula



(IV)

(V)

and mixtures of ketazines wherein R^1, R^2, R^3 and R^4 are each a straight chain alkyl radical of from 1 to 12 carbon atoms, a branched chain alkyl radical or cycloalkyl radical of from 3 to 12 carbon atoms, or a phenyl radical, the aforesaid radicals being unsubstituted or substituted with one or more halogen atoms or methyl, methoxy or nitro groups; R^1 and R^2 can be the same or different radicals, and R^3 and R^4 are radicals different from each other and are each a radical different from R^1 and R^2; or R^1 and R^2, or R^1 and R^3, or R^3 and R^4 together form an alkylene radical of from 3 to 11 carbon atoms, said alkylene radical being unsubstituted or substituted with one or more halogen atoms or methyl, methoxy or nitro groups, which comprises:

a. oxidizing a secondary alcohol of the formula

(VI)

alone or together with a different secondary alcohol of the formula

(VII)

or

(VIII)

wherein each of R^1, R^2, R^3 and R^4 has the same meaning as defined above, in the liquid phase employing molecular oxygen or a gaseous mixture containing the same, at a temperature and pressure which is sufficient to maintain the alcohol or alcohols in the liquid phase to produce a mixture containing the peroxidic products of the auto-oxidation of the alcohols in the liquid phase;

b. reacting the peroxidic products with ammonia in the presence of cyanogen or a nitrile $R^5(CN)_n$(IX) wherein *n* is an integer of from 1 to 6 and R^5 is a straight chain alkyl radical of from 1 to 12 carbon atoms, a branched chain alkyl radical or cycloalkyl radical of from 3 to 12 carbon atoms or a phenyl or pyridinyl radical, the aforesaid radicals being unsubstituted or substituted with from 1 to 6 halogen atoms or carbamyl, carboxylic, nitro, amino, nitroso, hydroxy or sulfonic acid groups, to produce the ketazine or mixture of ketazines; and

c. recovering the ketazine or mixture of ketazines.

3,972,875
HYDROXYBENZYLIDENE IMINOPHENYL-BENZOTHIAZOLES

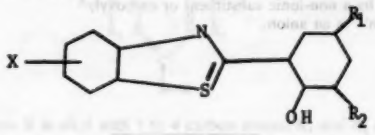
Richard F. Smith, Morristown, N.J., assignor to GAF Corporation, New York, N.Y.

Continuation of Ser. Nos. 818,386, April 22, 1969, abandoned, and Ser. No. 173,667, Aug. 20, 1971, abandoned. This application Feb. 22, 1974, Ser. No. 444,988

Int. Cl.² C07D 277/66, 277/68

U.S. Cl. 260—240 G 11 Claims

1. A red fluorescing 2-(2′-hydroxyphenyl) benzothiazole derivative having the formula:



wherein R_1 or R_2 is N=CHR$_3$ and R_3 is aryl selected from the group of phenyl, naphthyl, and phenyl substituted by alkyl having from 1 to 4 carbon atoms or halo, nitrogen heterocyclic radicals having 4 or 5 carbon atoms in an aromatically, unsaturated, 6-membered ring and aryl C_{1-30} alkyl wherein aryl is as defined above; and X and the other of R_1 and R_2 is hydrogen, halogen, alkyl having 1 to 30 carbon atoms, cycloalkyl having 5 to 9 carbon atoms, nitrogen heterocyclic as defined above. aryl as defined above and SO_3H.

3,972,876
PROCESS FOR THE PREPARATION OF SYMMETRICAL AND UNSYMMETRICAL AZINES AND MIXTURES THEREOF

Jean-Pierre Schirmann, Brignais, and Francis Weiss, Pierre-Benite, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

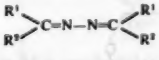
Continuation of Ser. No. 152,413, June 11, 1971, abandoned. This application Dec. 13, 1974, Ser. No. 532,650

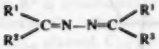
Claims priority, application France, June 12, 1970, 70.21704; Feb. 24, 1971, 71.06215; Dec. 29, 1970, 70.46994; Mar. 3, 1971, 71.07249

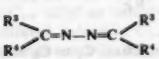
Int. Cl.² C07C 109/00

U.S. Cl. 260—240 G 18 Claims

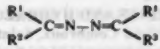
1. The process for the preparation of symmetrical azines of the formulas

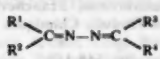

(I)


(II)

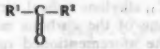

(III)

and unsymmetrical azines of the formulas

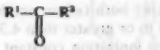

(IV)


(V)

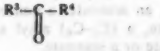
and mixtures of azines (I), (II) and (IV), and (I), (III) and (V), wherein R^1, R^2, R^3 and R^4 each is hydrogen, a straight-chain alkyl radical of from 1 to 12 carbon atoms, a branched-chain alkyl radical or a cycloalkyl radical of from 3 to 12 carbon atoms or a phenyl radical, the aforesaid radicals being unsubstituted or substituted with one or more halogen atoms or carbamyl, carboxylic, nitro, amino, nitroso, hydroxy, methoxy or sulphonic acid groups; and in which case R^1 and R^2 can be the same or different radicals, R^3 is a radical different from R^1 and R^2, R^3 and R^4 are radicals different from each other, and each are different radicals from R^1 and R^2; or R^1 and R^3, or R^1 and R^3, or R^3 and R^4 of either or both the >C=N— moieties together form an alkylene radical of from 3 to 11 carbon atoms, said alkylene radical being unsubstituted or substituted by one or more of the above atoms or groups, which comprises reacting a carbonyl compound of the formula


(VI)

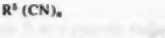
alone or together with a different carbonyl compound


(VII)

or


(VIII)

wherein R^1, R^2, R^3 and R^4 each has the same meaning as defined above, with ammonia and hydrogen peroxide in the presence of cyanogen or a nitrile of the formula


(IX)

wherein n is a integer of from 1 to 6 and R^5 is a saturated aliphatic or alicyclic radical of from 1 to 12 carbon atoms or a benzene or pyridine radical, the aforesaid radical being unsubstituted or substituted with one or more of the above atoms or groups.

3,972,877
BUTADIENE DERIVATIVES, PROCESS FOR THEIR PREPARATION AND THEIR USE AS OPTICAL BRIGHTENERS

Erich Schinzel, Hofheim, Taunus; Wilfried Sahm, Kelkheim, Taunus, and Günter Rösch, Altenhain, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jan. 7, 1974, Ser. No. 431,047

Claims priority, application Germany, Jan. 12, 1973, 2301410

Int. Cl.² C07D 307/79

U.S. Cl. 260—240 R 7 Claims

1. A compound of the formula

A-CH=CH-CH=CH-B

in which A is phenyl, naphthyl, 2-thienyl, 2-furanyl or 2-benzofuranyl which radicals are unsubstituted or substituted by lower alkyl, lower alkoxy, phenyl, carboxy, sulfo, cyano or lower carboalkoxy; and B is 2-benzofuranyl or lower alkyl-2-benzofuranyl.

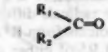
3,972,878

METHOD FOR PREPARING AZINES AND HYDRAZONES

Jean-Pierre Schirmann, Brignais; Jean Combroux, Sainte-foy-les-Lyon, and Serge Yvon Delavarenne, Francheville-le-Haut, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Feb. 7, 1975, Ser. No. 548,159
Claims priority, application France, Feb. 8, 1974, 74.4247
Int. Cl.² C07C 109/00
U.S. Cl. 260—240 G 21 Claims

1. A method for preparing an azine or a mixture of azines which comprises reacting (i) at least one carbonyl compound having the formula



wherein R_1 and R_2, which can be identical or different, are each an atom of hydrogen or a (C 1–C_{12}) straight chain alkyl radical, a (C_3–C_{12}) branched alkyl or cycloalkyl radical, a phenyl radical, a naphthyl radical, or a pyridine radical, or R_1 and R_2 together represent a C_2–C_{11} alkylene radical, straight-chained or branched, wherein one of the carbons may be replaced by an oxygen atom, the aforementioned radicals being unsubstituted or substituted with one or more halogen atoms or nitrile, nitro, hydroxy, alkoxy, carboxy, carbamyl or carbalkoxy groups, with (ii) a mixture of ammonia and hydrogen peroxide in the presence of (iii) both (*a*) an amide of a carboxylic acid having a pK equal to or greater than 4.3 or of a polycarboxylic acid having a first ionization constant equal to or greater than 4.3 and (*b*) a co-catalyst selected from the acids and the alkalimetal and ammonium salts of a phosphate, a phosphite, a mono- or di- (C_1–C_8) alkyl phosphate ester, a polyphosphate, a pyrophosphate, an arsenate, a benzene or toluene sulfonate or phosphonate, a (C_1–C_6) alkyl sulfate ester, a bicarbonate, an antimonate or a stannate.

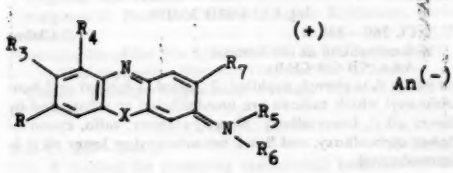
3,972,879

PROCESS FOR ISOLATING EASILY SOLUBLE BASIC OXAZINE DYESTUFFS AND PHENAZINE DYESTUFFS

Hubertus Psaar, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 17, 1974, Ser. No. 515,469
Claims priority, application Germany, Oct. 27, 1973, 2353987
Int. Cl.² C07D 265/38, 273/00, 295/00, 241/46
U.S. Cl. 260—244 R 6 Claims

1. Process for isolating oxazine dyestuffs or phenazine dyestuffs from solutions by adding urea or thiourea to said solutions in an amount of at least 1 mol of urea or thiourea per 1 mol of dyestuff and sufficient to precipitate said dyestuffs; said dyestuffs having the formula



in which
R is hydrogen-NR_1R_2;
R_1 and R_2 independently of one another are hydrogen; alkyl; alkenyl; phenyl; or phenyl substituted by a non-ionic substituent or carboxyl;
R_3 is hydrogen, methyl or alkoxy;
R_4 is hydrogen or together with R_3 forms an aromatic radical;
R_5 and R_6 independently of one another are hydrogen, alkyl or alkenyl;
R_7 is hydrogen, methyl or alkoxy;
X is oxygen or > N-R_8;
R_8 is hydrogen; alkyl; alkenyl; phenyl; or phenyl substituted by a non-ionic substituent or carboxyl;
$An^{(-)}$ is an anion.

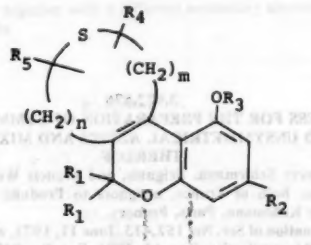
3,972,880

MORPHOLINE CONTAINING ESTERS OF THIENOBENZOPYRANS AND THIOPYRANOBENZOPYRANS

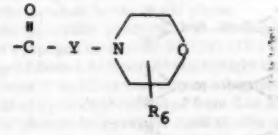
Louis Selig Harris, Richmond, Va.; Harry George Pars, Lexington, Mass.; Raj Kumar Razdan, Belmont, Mass., and John Clark Sheehan, Lexington, Mass., assignors to Sharps Associates, Cambridge, Mass.

Division of Ser. No. 448,401, March 5, 1974, which is a continuation-in-part of Ser. No. 212,820, Dec. 27, 1971, abandoned. This application Mar. 17, 1975, Ser. No. 558,640
Int. Cl.² C07D 495/04
U.S. Cl. 260—247.1 P 22 Claims

1. A compound of the formula



wherein *n* is 0 to 3, and *m* is 0 to 3 and $m + n = 2$ or 3, R_1 is a lower alkyl having 1 to 6 carbon atoms, R_2 is an alkyl having 1 to 20 carbon atoms or cycloalkyl-loweralkyl in which the cycloalkyl group has 3 to 8 carbon atoms and the lower alkyl group has 1 to 6 carbon atoms, R_4 is hydrogen or a lower alkyl having 1 to 6 carbon atoms, R_5 is hydrogen or a lower alkyl having 1 to 6 carbon atoms, and R_3 is



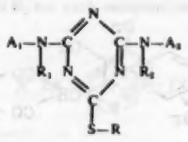
wherein Y is a straight or branched chain C_1 to C_8 alkylene, R_6 is hydrogen or a lower alkyl having 1 to 6 carbon atoms, and the nontoxic acid addition salts thereof.

3,972,881
TRIAZINYL DYES

Hans Altermatt, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 19, 1974, Ser. No. 498,698
Claims priority, application Switzerland, Aug. 22, 1973, 12067/73; June 6, 1974, 7727/74
Int. Cl.² C07D 251/52
U.S. Cl. 260—249 3 Claims

1. A vat dyestuff of the formula



(1),

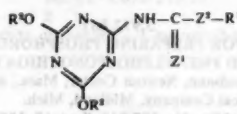
wherein R is alkyl with 1 to 4 carbon atoms, R_1 and R_2 each is independently hydrogen or alkyl with 1 to 4 carbon atoms and A_1 and A_2 each is independently anthraquinonyl which is optionally substituted by halogen, lower alkyl, lower alkoxy, lower alkanoyl, amino, phenylamino, benzoylamino, halobenzoylamino, phenylbenzoylamino, N,N-diloweralkyl-sulphamidobenzoylamino, lower alkylphenylsulphonylamino and phenylthio, phthaloylacridonyl which is optionally substituted by halogen and trifluoromethyl, benzanthronyl which is optionally substituted by lower alkyl, isothiazolanthronyl, phenylanthrapyrimidinyl and 4-(benzoylaminoanthraquinonyl)-6-lower alkylthio-s-triazin-(2)-yl-amino-1,1'-dianthrimide-2,2'-carbazole.

3,972,882
SYM.-TRIAZINE CARBAMATES

Yutaka Kodama; Tsutomu Kodama; Akira Takai, ; Masaakira Senoura; Isao Watanabe; Katsunori Tanaka; Tomonobu Yamaguchi; Norio Abe, and Takuya Kodama, all of Toyama, Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1974, Ser. No. 521,370
Claims priority, application Japan, Nov. 9, 1973, 48-125466
Int. Cl.² C07D 251/46
U.S. Cl. 260—249.5 18 Claims

1. A compound of the formula:



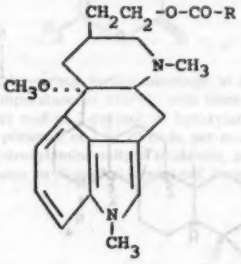
wherein R^1 is unsubstituted or a halogen-, C_{1-4} alkyl-, nitro-, C_{1-4} alkoxy-, C_{1-4} alkylenedioxy- C_{1-4} alkylthio-substituted C_{1-8} alkyl, C_{1-5} alkenyl, C_{3-7} cycloalkyl, C_{3-7} cycloalkyl C_{1-4} alkyl, phenyl-C_{1-4} alkyl or tetrahydrofurfuryl; R^2 is hydrogen, or unsubstituted halogen-, C_{1-4} alkyl-, C_{1-4} alkoxy-, or C_{1-4} alkylthio-substituted C_{1-4} alkyl or phenyl; and Z^1 and Z^2, which may be the same or different, each represents oxygen or sulfur.

3,972,883
1,6-DIMETHYL-8β-[2' OR 3'-PYRROYLOXYETHYL OR SUBSTITUTED PYRROYLOXYETHYL]-10α-METHOXYERGOLENE COMPOUNDS

Giuliana Arcari; Luigi Bernardi, both of Milan; Germano Bosisio, Palazzolo Milanese; Alfredo Glisser, and Innocenzio Sinatra, both of Milan, all of Italy, assignors to Societa Farmaceutici Italia S.p.A., Milan, Italy

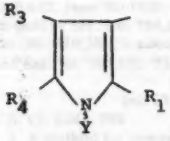
Filed Jan. 28, 1974, Ser. No. 436,927
Claims priority, application Italy, Feb. 2, 1973, 19941/73
Int. Cl.² C09D 457/02
U.S. Cl. 260—285.5 6 Claims

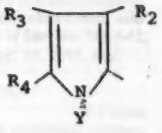
1. An ergoline compound of the formula:



VII

wherein R is a pyrrole radical of the formula:



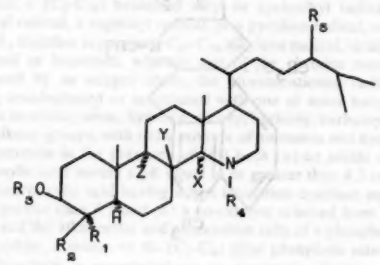


wherein

Y is hydrogen or a lower alkyl radical having from 1 to 4 carbon atoms;
R_1 is hydrogen or methyl;
R_2 is hydrogen or methyl; and
R_3 and R_4 are the same or different and are hydrogen, or a lower alkyl radical having from 1 to 4 carbon atoms.

3,972,884
D-HOMO-AZA-STEROIDS
Charles D. Jones, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
Filed Sept. 6, 1974, Ser. No. 503,564
Int. Cl.² C07D 215/12
U.S. Cl. 260—287 AZ **17 Claims**

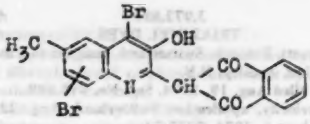
1. The compound of the formula



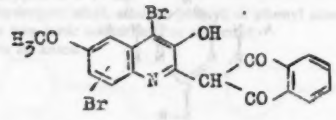
wherein:
R_1 and R_2 are both hydrogen or both methyl;
R_3 is hydrogen, C_1–C_4 alkanoyl, C_1–C_4 alkoxycarbonyl, or halo C_1–C_4 alkoxycarbonyl;
R_4 is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkanoyl, C_1–C_4 alkoxycarbonyl, or halo C_1–C_4 alkoxycarbonyl, and X is hydrogen, or R_4 and X when taken together form a double bond;
Y and Z are both hydrogen or taken together form a double bond;
R_5 is methyl or methylene, but is methyl only when X, Y, and Z are all hydrogen;
with the limitation that either X or both Y and Z must be hydrogen; and
the pharmaceutically acceptable salts thereof.

3,972,885
OXYQUINOPHTHALONE COLORING MATERIAL
Yoshio Kimura, and Kiyoshi Himeno, both of Kitakyushu, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 171,355, Aug. 12, 1971, abandoned. This application Aug. 23, 1973, Ser. No. 390,849
Claims priority, application Japan, Aug. 14, 1970, 45-71280
Int. Cl.² C09B 25/00
U.S. Cl. 260—289 GP **15 Claims**

1. A coloring material having the formula:

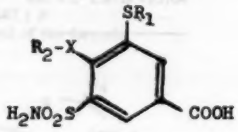


2. A coloring material having the formula:



3,972,886
CERTAIN 4-PHENOXY-3-HETEROARYLMETHYL OR ETHYL SULFAMYL BENZOIC ACID DERIVATIVES
Peter Werner Feit, Gentofte; Ole Bent Tvaermose Nielsen, Vanlose, and Herta Bruun, Graested, all of Denmark, assignors to Leo Pharmaceutical Products Ltd. and A/S Lovens Kemiske Fabrik Produktionsakieselskab, both of Ballerup, Denmark
Division of Ser. No. 370,609, June 18, 1973, Pat. No. 3,950,376. This application Mar. 17, 1975, Ser. No. 559,160
Claims priority, application United Kingdom, July 13, 1972, 32909/72; Nov. 7, 1972, 51384/72; Jan. 24, 1973, 3658/73
Int. Cl.² C07D 213/28
U.S. Cl. 260—294.8 F **10 Claims**

1. A compound of the formula I

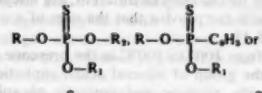


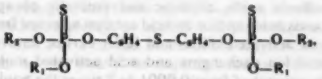
I

in which
R_1 is selected from the group consisting of methyl and ethyl radicals monosubstituted with furyl, thienyl, and pyridyl;
R_2 stands for a phenyl radical, optionally being substituted with a member selected from the group consisting of lower alkyl, hydroxy and lower alkoxy;
X stands for a member selected from the group consisting of oxygen and sulphur;
and pharmaceutically acceptable, non-toxic salts of the carboxylic acid of formula *I*; and esters thereof with cyanomethanol, benzyl alcohol, and C_1–C_6 alkanols.

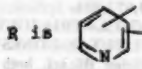
3,972,887
PROCESS FOR PREPARING PHOSPHOROTHIOATES AND PHENYLPHOSPONOTHIOATES
Harold H. Freedman, Newton Center, Mass., assignor to The Dow Chemical Company, Midland, Mich.
Continuation of Ser. No. 397,513, Sept. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 207,535, Dec. 13, 1971, abandoned. This application June 12, 1975, Ser. No. 586,441
Claims priority, application Italy, Dec. 12, 1972, 054615/72
Int. Cl.² C07D 213/44
U.S. Cl. 260—294.8 K **12 Claims**

1. In the process of preparing a compound corresponding to the formula





wherein: R_1 and R_3 are each independently lower alkyl; and

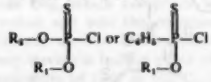


wherein:

n is 0, 1, 2 or 3; and

X is nitro, cyano, halo, lower alkyl, lower alkoxy, lower alkylthio or lower alkylsulfinyl, with the proviso that R does not bear more than one nitro group, lower alkylthio group or lower alkylsulfinyl group;

by reacting in an inert organic liquid medium under alkaline conditions and with efficient blending (a) a compound corresponding to the formula $R-O^-M^+$ or $M^+{}^-O-C_6H_4-S-C_6H_4-O^-M^+$ in solid particulate form with (b) a compound dissolved in said liquid medium and corresponding to the formula



wherein M is an alkali metal and R, R_1 and R_2 have the aforesaid meaning;

the improvement consisting of conducting the process in the presence of a small but catalytic amount of a quaternary ammonium salt having a minimum solubility of at least 1 weight percent in the liquid reaction medium at 25°C and having a total aggregate carbon content of at least about 10 carbon atoms.

3,972,888

PROCESS FOR THE PREPARATION OF 1-HYDROXY-PYRIDONES

Gerhard Lohaus, Kelkheim, Taunus, and Walter Dittmar, Hofheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

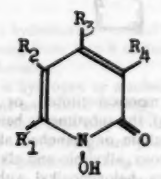
Continuation-in-part of Ser. No. 343,102, March 20, 1973, abandoned. This application Aug. 23, 1974, Ser. No. 499,988

Claims priority, application Germany, Mar. 25, 1972, 2214608

Int. Cl.² C07D 213/50

U.S. Cl. 260—297 Z **1 Claim**

1. The method of making a 1-hydroxy-2-pyridone of the formula

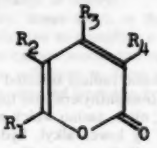


wherein R_1 is straight-chain or branched alkyl having 1 to 17 carbon atoms, alkenyl having 2 to 17 carbon atoms, cycloalkyl having 3 to 8 carbon atoms, cyclohexylalkyl having 1 to 2 carbon atoms in the alkyl, furyl, or furylvinyl, or is phenyl, phenylalkyl having 1 to 4 carbon atoms in the alkyl, phenylalkenyl having 2 to 4 carbon atoms in the alkenyl, benzhydryl, phenoxymethyl, phenylmercaptomethyl, or phenylsulfonylmethyl, all of which may be at least mono-substituted in the phenyl nucleus by methyl, methoxy, amino, nitro, methoxycarbonyl, cyano, or halogen,

R_2 is hydrogen, lower alkyl, lower alkenyl, lower alkinyl, or benzyl;

R_3 is hydrogen, lower alkyl, or phenyl;

R_4 is hydrogen, lower alkyl, lower alkenyl, methoxymethyl, benzyl, chlorine, or bromine, which comprises reacting a 2-pyrone of the formula



wherein R_1–R_4 have their earlier meanings, at a temperature from room temperature to 150°C., with from 1 to 10 mol equivalents, per mol of 2-pyrone, of hyroxylamine or a salt thereof in the presence of 1 to 20 mols, per mol of hydroxylamine or of hydroxylamine salt, of imidazole, a 2-aminopyridine, or of a mono- or di-methyl substituted 2-aminopyridine.

3,972,889

FUNGICIDAL N-POLYHALOVINYLTHIOFORMAMIDES

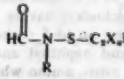
Melancthon S. Brown, deceased, late of Berkeley, Calif., and Gustave Kohn, administrator, Berkeley, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 386,270, Aug. 6, 1972, Pat. No. 3,888,992, which is a division of Ser. No. 253,643, May 15, 1972, Pat. No. 3,771,991, which is a division of Ser. No. 33,878, April 29, 1970, Pat. No. 3,697,571, which is a continuation-in-part of Ser. Nos. 810,368, March 25, 1969, abandoned, and Ser. No. 748,642, June 30, 1968, abandoned, which is a continuation-in-part of Ser. No. 704,555, Feb. 12, 1968, abandoned, said Ser. No. 810,368, is a continuation-in-part of Ser. No. 748,642, and Ser. No. 764,555. This application Apr. 18, 1975, Ser. No. 569,517

Int. Cl.² A01N 9/00, 9/20

U.S. Cl. 424—298 **5 Claims**

1. A method for controlling fungi which comprises contacting said fungi or their hosts with a fungicidally effective amount of a polyhalovinylthioformamide of the formula



wherein R is hydrogen or alkyl of 1 to 4 carbon atoms, X is halogen of atomic number 17 to 35 and *a* is 2 or 3.

3,972,890

PROCESS FOR PREPARING A 2(ω-AMINOALKYL)-1,3-HETEROCYCLIC COMPOUNDS

Artur Botta, Krefeld-Bockum, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 15, 1974, Ser. No. 461,209

Claims priority, application Germany, Apr. 26, 1973, 2321054

Int. Cl.² C07D 235/06, 263/56, 277/64

U.S. Cl. 260—304 R 7 Claims

1. Process for preparing a 5-membered heterocycle which comprises reacting a diamine, aminohydroxy or aminothiol compound having the formula

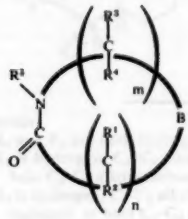
wherein

A is a bivalent aromatic radical selected from the group of o-phenylene and o-naphthylene and the foregoing substituted by halogen, nitro, amino which may also be mono- or di-substituted by lower alkyl, hydroxy, C_{1-4} alkoxy, C_{6-10} aryloxy, C_{1-4} alkylmercapto, C_{6-10} arylmercapto C_{1-4} alkylsulfonyl or C_{6-10} arylsulfonyl;

X is oxygen, sulfur or the group

wherein

R^7 is as defined herein with a lactam having the formula



wherein

B is selected from the group of a single bond C_{6-10} arylene, oxygen, sulfur and the group

wherein

R^6 is as defined herein;

R^1, R^2, R^3 and R^4, which may be the same or different, are selected from the group of hydrogen, halogen nitro, and alkyl having up to 18 carbon atoms, cycloalkyl having 4 to 12 carbon atoms, phenylalkyl having up to 5 carbon atoms in the alkyl portion, phenyl and naphthyl and the foregoing substituted by halogen, nitro, amino which may also be mono- or di- substituted by lower alkyl, hydroxy, C_{1-4}alkoxy, C_{6-10} aryloxy, C_{1-4} alkylmercapto, C_{6-10} arylmercapto, C_{1-4} alkylsulfonyl or C_{6-10} arylsulfonyl;

R^5, R^6 and R^7, which may be the same or different, are selected from the group of hydrogen and alkyl having up to 18 carbon atoms, cycloalkyl having 4 to 12 carbon atoms, phenylalkyl having up to 5 carbon atoms in the alkyl portion, phenyl and naphthyl and the foregoing substituted by halogen, nitro, amino which may also be mono- or disubstituted by lower alkyl, hydroxy, C_{1-4} alkoxy, C_{6-10} aryloxy, C_{1-4} alkylmercapto, C_{6-10} arylmercapto, C_{1-4} alkylsulfonyl or C_{6-10} arylsulfonyl; and

n and *m* which may be the same or different, are integers of from 1 to 14, with the proviso that the sum of *n* and *m* does not exceed 15,

at a temperature of from 100° to 300°C in the presence of an acid selected from the group of mineral acids, aliphatic and aromatic sulfonic acids, aliphatic and aromatic phosphonic acids and Lewis acids and/or an acid catalyst selected from the group of acid activated silicas and fuller earths, natural and synthetic acid ion exchangers and acid activated molecular sieves, in an amount of from 0.0001 to 2 times the equivalent quantity per mole of the lactam.

3,972,891

1-PHENOXY-1-[HALO-1,2,4-TRIAZOLYL-(1)]-3,3-DIMETHYL-BUTAN-2-ONES

Wolfgang Krämer; Karl Heinz Büchel, both of Wuppertal; Wilhelm Brandes, Cologne, and Paul-Ernst Frohberger, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

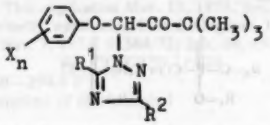
Filed June 28, 1974, Ser. No. 484,355

Claims priority, application Germany, July 6, 1973, 2334352

Int. Cl.² C07D 249/08

U.S. Cl. 260—308 R 7 Claims

1. A 1-phenoxy-1-[halo-1,2,4-triazolyl-(1)]-3,3-dimethyl-butan-2-one of the formula



in which

X is chlorine, bromine, fluorine nitro, alkyl of 1 to 4 carbon atoms, haloalkyl.

3,972,892

1-[1,2,4-TRIAZOLYL-(1)]-2-ARYLOXY-3-HYDROXY-ALKANES

Karl Heinz Büchel; Wolfgang Krämer, both of Wuppertal; Helmut Kaspers, Leverkusen, and Wilhelm Brandes, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

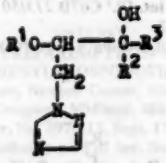
Filed Sept. 27, 1974, Ser. No. 509,881

Claims priority, application Germany, Oct. 5, 1973, 2350122

Int. Cl.² C07D 249/08

U.S. Cl. 260—308 R 5 Claims

1. A 1-[1,2,4-triazolyl-(1)]-2-aryloxy-3-hydroxyalkane of the formula



in which

R^1 is optionally monosubstituted or polysubstituted phenyl or naphthyl, the substituents being selected from halogen, straight-chain or branched alkyl with 1 to 6 carbon atoms, alkoxy, alkylthio and alkylsulfonyl with 1 to 4 carbon atoms, halogenoalkyl with 1 or 2 carbon

atoms and 1 to 5 halogen atoms, halogenoalkoxy and halogenoalkylthio with 1 or 2 carbon atoms and 3 to 5 halogen atoms, alkoxycarbonyl with 1 to 4 carbon atoms in the alkoxy moiety, phenyl in the o - or p - position, amino and nitro,

R^2 is hydrogen; alkyl with up to 6 carbon atoms; optionally substituted phenyl or naphthyl or phenalkyl or naphthalkyl with 1 or 2 carbon atoms in the alkyl moiety, substituents on the phenyl or naphthyl radicals being selected from fluorine, chlorine, alkyl with up to 4 carbon atoms and alkoxy with up to 4 carbon atoms; allyl or cyclohexyl, and

R^3 is straight-chain or branched alkyl with 1 to 6 carbon atoms, or cycloalkyl with 5 to 7 carbon atoms, or can be hydrogen if R^2 does not denote hydrogen,

or a salt thereof with fungicidal activity.

3,972,893
METHOD FOR PREPARING COBALT PHTHALOCYANINE COMPLEX SALTS

Toshiki Tanaka, Wakayama, Japan, assignor to Nippon Chemical Works Co., Ltd., Wakayama, Japan

Filed Mar. 12, 1975, Ser. No. 557,673
Claims priority, application Japan, Aug. 21, 1970, 45-72781
Int. Cl.² C09B *47/04*
U.S. Cl. 260—314.5 **5 Claims**

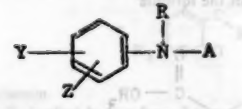
1. An improved method for preparing a 6-valence cobalt phthalocyanine complex salt composed of a 6-valence cobalt phthalocyanine complx, in which an aliphatic polyamine has been coordinated at the two ligands not occupied by the phthalocyanine ring, which comprises bringing phthalodinitrile and a cobalt salt into the condensation reaction in a saturated aliphatic alcohol solvent containing at least one hydroxyl group having a boiling point of above 100°C. at a reaction temperature of 100° to 150°C., to such an extent as to form a deep purplish blue-colored substance as a precipitate from the solvent, adding an aqueous inorganic or organic acid solution to the reaction mixture at a temperature greater than 50°C., until the reaction mixture becomes Congo Red acidic, and reacting said reaction mixture as such or after it has been separated by filtration with an aliphatic polyamine.

3,972,894
SYNTHESIS OF OXINDOLES FROM ANILINES AND β-THIO CARBOXYLIC ESTERS OR AMIDES

Paul G. Gassman, Columbus, Ohio, assignor to The Ohio State University Research Foundation, Columbus, Ohio

Division of Ser. No. 355,207, April 27, 1973, Pat. No. 3,897,451. This application Feb. 27, 1975, Ser. No. 553,589
Int. Cl.² C07D *209/34*; **C07C** *149/46*, *103/78*, *145/02*
U.S. Cl. 260—325 R **11 Claims**

1. A process which comprises reacting in an organic liquid solvent which is sufficiently polar to dissolve at least a portion of the reactants under substantially anhydrous conditions at a temperature of from about −78°C. to about 10°C. a compound of the formula:



(I)

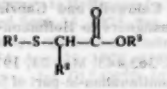
wherein

R is hydrogen or a hydrocarbon radical free of aliphatic unsaturation containing from 1 to 8 carbon atoms;

A is chlorine or bromine;

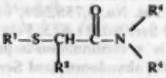
each of Y and Z is hydrogen or a substituent which does not donate electrons any more strongly than a meta methoxy group, and not more than one of Y and Z, as a substituent, is ortho to the —N(R)A group position on the ring; the —N(R)A group position having at least one ring carbon atom ortho thereto in an unsubstituted state;

with a β-thio carboxylic ester or amide having a formula selected from the group consisting of



(II)

and



(III)

wherein

R^1 is lower alkyl, phenyl or benzyl;

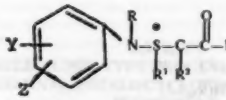
R^2 is hydrogen, lower alkyl, phenyl or benzyl;

R^3 is lower alkyl, phenyl or benzyl;

each R^4 is hydrogen, lower alkyl, or the two R^4 groups are taken with the nitrogen to complete a ring containing from 4 to 5 methylene carbon atoms and up to one ring oxygen atom; for a time sufficient to form an azasulfonium salt having a formula selected from the group consisting of

(IV)

and



(V)

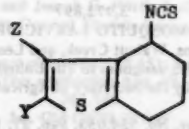
wherein Y, Z, R, R^1, R^2, R^3, each R^4 and A are as defined above, and at least one of the phenyl ring carbon atoms ortho to the nitrogen is in the unsubstituted state.

3,972,895
BENZOTHIENYLISOTHIOCYANATES

Goro Asato, Titusville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 458,272, April 5, 1974, Pat. No. 3,944,567. This application Aug. 11, 1975, Ser. No. 603,465
Int. Cl.² C07D *333/00*
U.S. Cl. 260—329 S **7 Claims**

1. A compound of the formula:



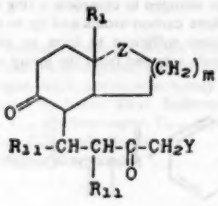
wherein Y is a member selected from the group consisting of hydrogen, halogen, and alkyl C_1–C_4, and Z is a member selected from the group consisting of hydrogen and alkyl C_1–C_4.

3,972,896
ARYL KETALS OF POLYCYCLIC OXO COMPOUNDS AND PROCESSES

Michael Rosenberger, Caldwell, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 363,443, May 24, 1973, Pat. No. 3,907,827, which is a continuation-in-part of Ser. No. 74,519, Sept. 22, 1970, Pat. No. 3,758,509, which is a continuation-in-part of Ser. No. 11,023, Feb. 12, 1970, Pat. No. 3,708,500, which is a continuation-in-part of Ser. No. 825,389, May 16, 1969, abandoned, and Ser. No. 824,319, May 13, 1969, Pat. No. 3,544,600. This application June 9, 1975, Ser. No. 584,992
Int. Cl.² C07D 317/44
U.S. Cl. 260—340.5 4 Claims

1. The compounds of the formula



X

wherein Y is

B is the remaining residue of a hydrocarbyl group which may be monocyclic or bicyclic and which may bear one or more additional substituents selected from the group consisting of lower alkyl or lower alkoxy; R_1 is a primary alkyl group of from 1 to 5 carbon atoms; R_5, R_{11}, R_{12}, R_{14} and R_{15} are each independently hydrogen or lower alkyl; Z is carbonyl or a group of the formula

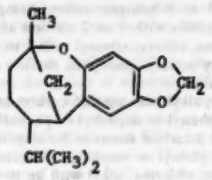
R_7 is hydrogen or lower carboxylic acyl; R_8 is hydrogen or lower aliphatic hydrocarbyl and *m* is an integer having a value of 1 to 2
and optical enantiomers thereof.

3,972,897
MOSQUITO LARVICIDE

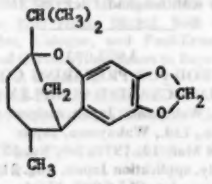
Kenneth L. Stevens, Walnut Creek, and Leonard Jurd, Berkeley, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 554,053, Feb. 27, 1975, Pat. No. 3,954,991. This application Oct. 30, 1975, Ser. No. 627,328
Int. Cl.² C07D 317/48
U.S. Cl. 260—340.5 4 Claims

1. A compound of the structure



2. A compound of the structure

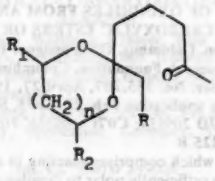


3,972,898
PROCESS FOR THE PREPARATION OF 6,6-ALKYLENEDIOXYALKAN-2-ONES

Urs Oskar Hengartner, Montclair, and Pius Anton Wehrli, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

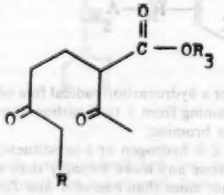
Filed Mar. 20, 1975, Ser. No. 560,062
Int. Cl.² C07D 317/26
U.S. Cl. 260—340.9 15 Claims

1. A process for the preparation of a 6,6-alkylenedioxyalkan-2-one of the formula

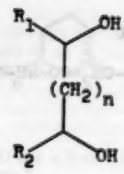


wherein R, R_1 and R_2 are hydrogen or lower alkyl and n is 0, 1 or 2 which comprises the steps of:

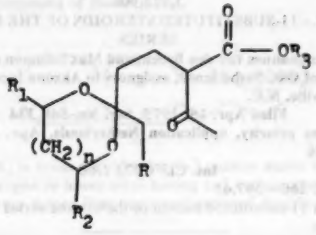
a. treating a compound of the formula



wherein R_3 is lower alkyl with an alkylene glycol of the formula



wherein R_1 and R_3 are as defined above in reaction system comprising an acid-catalyst selected from the group consisting of sulfuric acid and lower alkyl and aromatic sulfonic acids, and an aromatic solvent to form a delta-alkylenedioxy-beta-ketoester of the formula



wherein R, R_1, R_2, R_3 and n are as defined above;

b. treating the delta-alkylenedioxy-beta-ketoester with an aqueous solution of an alkali metal hydroxide; and

c. treating the aqueous solution with acid.

3,972,899

α-PYRONE DERIVATIVES

Mikio Sawaki; Isao Iwataki, both of Odawara; Hisao Ishikawa, Oiso; Shozo Yamada, Hiratsuka, and Yasushi Yasuda, Fujisawa, all of Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

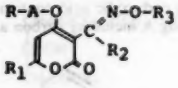
Continuation-in-part of Ser. No. 347,790, April 4, 1973. This application Nov. 9, 1973, Ser. No. 414,300

Claims priority, application Japan, Nov. 24, 1972, 47-117141

Int. Cl.² A01N 9/20; C07D 309/38

U.S. Cl. 260—343.5 **5 Claims**

1. A compound of the formula



wherein

R_1 is alkyl having from 2 to 6 carbon atoms or phenyl;

R_2 is alkyl having from 2 to 6 carbon atoms or phenyl;

R_3 is alkyl having from 1 to 10 carbon atoms or alkenyl having six or less carbon atoms or alkynyl having six or less carbon atoms;

R is alkyl having from 1 to 20 carbon atoms, or phenyl or phenyl substituted with halogen, methyl, methoxy or nitro group;

A is carbonyl or sulfonyl.

3,972,900

7-SUBSTITUTED BENZOFURAN DERIVATIVES

Graham Alwyn Fothergill, Knebworth; John Mervyn Osbond, Hatfield, and James Charles Wickens, St. Albans, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

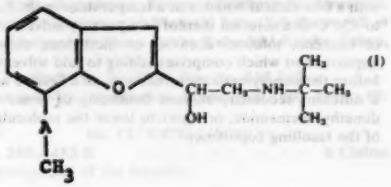
Filed Sept. 15, 1975, Ser. No. 613,687

Claims priority, application United Kingdom, Sept. 26, 1974, 41890/74; Aug. 29, 1975, 41890/74

Int. Cl.² C07D 307/81

U.S. Cl. 260—346.2 R **7 Claims**

1. A compound of the formula



(I)

, wherein A is hydroxymethylene or carbonyl, and pharmaceutically acceptable acid addition salts thereof.

3,972,901

DIELS-ALDER TYPE PROCESS INVOLVING A GEMINAL-DIHALOCYCLOPROPANE AND A DIENOPHILE

Gene C. Robinson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jan. 18, 1971, Ser. No. 107,588

Int. Cl.² C07D 307/89

U.S. Cl. 260—346.3 **15 Claims**

1. A process which comprises heating (i) a gem-dihalocyclopropane having (a) at least four carbon atoms in the molecule, (b) at least one hydrogen atom on a carbon atom attached to the cyclopropane ring via a single bond and (c) not more than one ring fused to the cyclopropane ring, with (ii) a dienophile to an elevated temperature within the range of from about 100° to about 250°C. sufficient to cause formation of hydrogen halide and an adduct containing a six-membered olefinically unsaturated ring having a halogen atom on one of the ethylenic carbon atoms.

3,972,902

4,4′-ISOPROPYLIDENE-BIS(3- AND 4-PHENYLENEOXYPHTHALIC ANHYDRIDE)

Darrell R. Heath, and Joseph G. Wirth, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 108,151, Jan. 20, 1971, Pat. No. 3,787,475. This application Aug. 18, 1972, Ser. No. 281,749

Int. Cl.² C07D 307/89

U.S. Cl. 260—346.3 **2 Claims**

1. The compound 2,2-bis-[4-(2,3-dicarboxyphenoxy)-phenyl]propane dianhydride.

3,972,903

MOLECULAR WEIGHT CONTROL IN CHARGE-TRANSFER COPOLYMERIZATION

James Richard Gross, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 317,114, Dec. 21, 1972, abandoned. This application July 26, 1974, Ser. No. 492,317

Int. Cl.² C08F 222/06

U.S. Cl. 260—346.8 R 3 Claims

1. In a process for the preparation of an alternating copolymer of an olefinic monomer having 2–4 carbon atoms and a monomer selected from an olefinically unsaturated dicarboxylic acid or the anhydride thereof which comprises polymerizing a mixture of the monomers under autogenous pressure with a free radical initiator at a temperature in the range of 0° to 150°C in a solution thereof in a primary solvent consisting of benzene, toluene, acetone, or methylene chloride, the improvement which comprises adding to said solvent solution before the copolymerization reaction, an effective amount of a different secondary solvent consisting of lower alkanols, dimethyl formamide, or water to lower the molecular weight of the resulting copolymer.

3,972,904

WATER-SOLUBLE DYESTUFFS READILY CONVERTIBLE INTO INSOLUBLE FORM AND PROCESS FOR PREPARING THEM

Hans-Ulrich von der Eltz, Frankfurt am Main; Dieter Gunther, Kelkheim, Taunus; Karl-Heinz Krell, Kronberg; Karl Matterstock, Hofheim, Taunus, all of Germany, and Hansjorg Vollmann, Coventry, R.I., assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

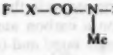
Filed June 28, 1971, Ser. No. 157,667

Claims priority, application Germany, June 30, 1970, 2032237

Int. Cl.² C09B 1/36, 1/38; D06P 3/52

U.S. Cl. 260—372 4 Claims

1. A water-soluble dyestuff of the formula



wherein F represents the radical of a water-insoluble anthraquinone dyestuff, X represents oxygen, sulfur, or nitrogen substituted by hydrogen or lower alkyl, and Me represents an alkali metal or ammonium ion.

3,972,905

QUINONEMONOXIME-ARYLACYLHYDRAZONES

Arno Widdig, Blecher, Germany; Ewald Urbschat, deceased, late of Cologne, Germany (by Gertrud Emma Maria Gerda Urbschat, heiress, Cologne, Germany; Ferdinand Grewe, Burscheid, and Helmut Kaspers, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

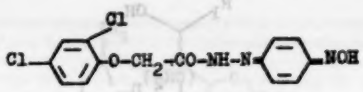
Filed Feb. 27, 1975, Ser. No. 553,874

Claims priority, application Germany, Mar. 4, 1974, 2410184

Int. Cl.² C07C 131/00, 149/42

U.S. Cl. 260—396 N 2 Claims

1. The compound quinonemonoxime-2,4-dichlorophenoxyacetic acid hydrazide of the formula



3,972,906

NOVEL - 11-SUBSTITUTED STEROIDS OF THE ESTRANE SERIES

Albertus Joannes van den Broek, and Max Salomon de Winter, both of Oss, Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

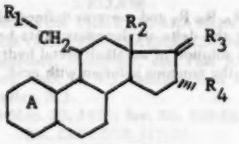
Filed Apr. 15, 1975, Ser. No. 568,334

Claims priority, application Netherlands, Apr. 26, 1974, 7405626

Int. Cl.² C07J 1/00

U.S. Cl. 260—397.45 8 Claims

7. An 11-substituted steroid of the estrane series having the formula:



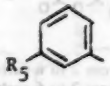
in which

R_1 is a member of the group consisting of hydroxy, acyloxy derived from a saturated or unsaturated organic carboxylic acid containing 1 to 18 carbon atoms, alkoxy containing 1 to 6 carbon atoms, cycloalkyloxy containing 5 to 6 carbon atoms, tetrahydropyranyloxy, fluoro and chloro;

R_2 is a member of the group consisting of methyl and ethyl;

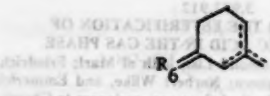
R_3 is O or $(\alpha Y)(\beta Z)$, in which Y = H or a saturated or unsaturated alkyl group containing 1 to 4 carbon atoms and Z = a member of the group consisting of hydroxy, acyloxy derived from a saturated or unsaturated organic carboxylic acid containing 1 to 18 carbon atoms, alkoxy containing 1 to 4 carbon atoms, cycloalkyloxy containing 5 to 6 carbon atoms and tetrahydropyranyloxy;

R_4 is a member of the group consisting of hydrogen, hydroxy, and acyloxy derived from a saturated or unsaturated organic carboxylic acid containing 1 to 18 carbon atoms; and ring A including carbon atom 6 is



in which

R_5 is a member of the group consisting of hydrogen, hydroxy, acyloxy derived from a saturated or unsaturated organic carboxylic acid containing 1 to 18 carbon atoms, alkoxy containing 1 to 4 carbon atoms, cycloalkyloxy containing 5 to 6 carbon atoms, and tetrahydropyranyloxy, or



in which

R_6 is hydrogen or O and a double bond is present starting from carbon atoms 5.

3,972,907

ANTI-HYPERLIPIDEMIC FATTY ACIDS AND ESTERS

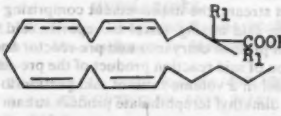
John S. Baran, Winnetka, and Chi-Dean Liang, Glenview, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Mar. 24, 1975, Ser. No. 561,646

Int. Cl.² C11C 3/02

U.S. Cl. 260—410.9 R 7 Claims

1. A compound of the formula



wherein R_1 is lower alkyl having 1–7 carbon atoms inclusive, R_2 is hydrogen or lower alkyl having 1–7 carbon atoms inclusive, and the dotted lines represent optional double bonds.

3,972,908

ORGANOTIN COMPOUNDS

John Desmond Collins, Albrighton; Harold Coates, Wombourn, and Iftikhar Hussain Siddiqui, Birmingham, all of England, assignors to Albright & Wilson Limited, Oldbury, England

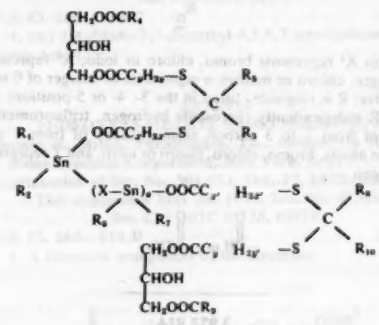
Division of Ser. No. 418,591, Nov. 22, 1973, Pat. No. 3,894,989. This application Dec. 5, 1974, Ser. No. 529,799

Claims priority, application United Kingdom, Nov. 29, 1972, 55042/72; Sept. 10, 1973, 42451/73

Int. Cl.² C07F 7/22

U.S. Cl. 260—429.7 26 Claims

1. An organotin compound of the generic formula



wherein

a is 0 or 1,

each of x, x', y and y', which are the same or different, is an integer of 1–6,

each of R_1, R_2, R_6 and R_7, which are the same or different is an alkyl group of 1 to 12 carbon atoms, a cycloalkyl group, an aromatic hydrocarbyl group or an aralkyl hydrocarbyl group, each of R_4 and R_9, which are the same or different, is as defined above for R_1, R_2, R_6 and R_7 or is an alkyl group of 13–21 carbon atoms, an alkenyl group of 2 to 21 carbon atoms, each of R_5 and R_{10}, which are the same or different, is as defined above for R_4 and R_9 or is hydrogen, each of R_3 and R_8 is as defined for R_4 and R_9 or is a substituted phenyl group with at least one substituent which is an alkyl group of 1 to 6 carbon atoms, an alkoxy group of 1 to 6 carbon atoms or a hydroxy group, or at least one of the pairs R_3 and R_5 and R_8 and R_{10}, together with the carbon atom to which they are attached, forms a cycloalkyl ring and X is oxygen or sulfur.

3,972,909

α,α-DIMETHYLBENZYLUREAS AND USE AS HERBICIDES

Hiroshi Kubo, Yokohama; Tatuya Michibayashi, Kawasaki; Nansho Seki, Tokyo, and Noriyuki Sato, Yokohama, all of Japan, assignors to Shova Denko Kabushiki Kaisha, Tokyo, Japan

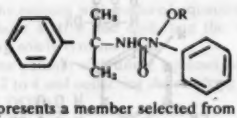
Filed Oct. 29, 1974, Ser. No. 518,812

Claims priority, application Japan, Oct. 30, 1973, 48-121204

Int. Cl.² C07C 119/20

U.S. Cl. 260—453 R 6 Claims

1. A compound of the formula



wherein R represents a member selected from alkyl and alkenyl radicals of at most 4 carbon atoms.

3,972,910

PREPARATION OF A CHLORINATED DIISOCYANATE

Sidney H. Metzger, Leverkusen, Germany; Marvin L. Kaufman, Somerville, N.J., and John E. Over, Pittsburgh, Pa., assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

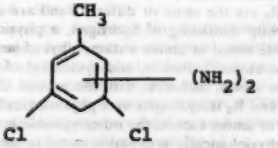
Division of Ser. No. 53,710, July 9, 1970, abandoned, which is a continuation of Ser. No. 688,363, Dec. 6, 1967, abandoned. This application July 7, 1975, Ser. No. 594,131

Int. Cl.² C07C 118/02, 119/048

U.S. Cl. 260—453 PH 1 Claim

1. A method of preparing a chlorinated diisocyanate comprising the steps:

A. reacting 2,4- or 2,6-toluene diamine or mixtures thereof which are dissolved in an inert organic solvent with a chlorinating agent selected from the group consisting of N-chlorosuccinimide and t-chlorobutylhypochlorite at a temperature of from about 10°C to about 90°C, thereby forming a chlorinated diamine having the general formula



and

and

B. reacting said diamine with phosgene.

3,972,911
N,N'(CYANO-PHENYLENE)DIOXAMIC ACIDS AND ESTERS

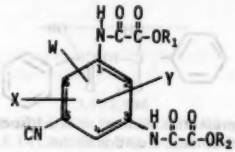
John B. Wright, and Charles M. Hall, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 382,762, July 26, 1973, which is a continuation-in-part of Ser. No. 317,005, Dec. 20, 1972, abandoned. This application June 10, 1974, Ser. No. 477,816

Int. Cl.² C07C *121/78*

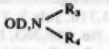
U.S. Cl. 260—465 D **17 Claims**

1. A compound of the formula

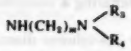


wherein W, X and Y are the same or different and are selected from the group consisting of hydrogen, alkyl from one to six carbon atoms, inclusive, phenyl, alkoxy with the alkyl group having from one to six carbon atoms, inclusive, hydroxy, nitro, halogen, trifluoromethyl and

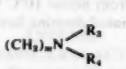
wherein Q is selected from



and



wherein D is selected from the group consisting of hydrogen, alkyl from one to six carbon atoms, inclusive, phenyl,



and a physiologically acceptable metal or amine cation, *m* is 2 or 3. R_3 and R_4 are the same or different and are selected from the group consisting of hydrogen, alkyl from one to three carbon atoms, inclusive,

R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, a physiologically acceptable metal or amine cation, alkyl of seven to twelve carbon atoms, inclusive, and cycloalkyl of four to eight carbon atoms, inclusive, with the proviso that when one of R_1 and R_2 is hydrogen or a physiologically acceptable metal or amine cation, the other variable is not hydrogen or a physiologically acceptable metal or amine cation.

3,972,912
PROCESS FOR THE ESTERIFICATION OF TEREPHTHALIC ACID IN THE GAS PHASE

Horst-Dieter Wulf; Ferdinand List, both of Marl; Friedrich-August Orlowski, Haltern; Norbert Wilke, and Emmerich Pflegerl, both of Marl, all of Germany, assignors to Chemische Werke Huls Aktiengesellschaft

Filed Nov. 29, 1973, Ser. No. 420,307

Claims priority, application Germany, Dec. 15, 1972, 2261333

Int. Cl.² C07C *69/82*

U.S. Cl. 260—475 R **9 Claims**

1. In the continuous method for the preparation of dimethyl terephthalate by the esterification of terephthalic acid with methanol in the gas phase at temperatures between about 280° to 350°C, wherein said terephthalic acid in solid form is contacted with hot vapor stream of methanol in a mixing vessel to produce a stream of said methanol and said terephthalic acid, introducing said stream into a pre-reactor and introducing the reaction product of the pre-reactor into a follow-up reactor having a solid bed catalyst to produce a dimethyl terephthalate product stream, the improvement comprising heating said stream from said mixing vessel to vaporize said terephthalic acid therein prior to entry into said pre-reactor and recirculating a portion of said reaction product of the pre-reactor to said mixing vessel in a volume ratio of said portion to the remainder of said dimethyl terephthalate product stream of about 0.5 : 1 to 5 : 1.

3,972,913
SUBSTITUTED BENZENEMETHANOL COMPOUNDS

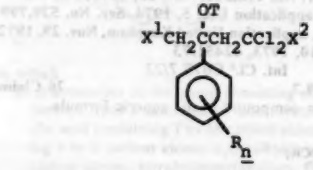
Lowell D. Markley, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 3, 1974, Ser. No. 466,569

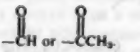
Int. Cl.² C07C *31/16, 69/07, 69/145*

U.S. Cl. 260—488 CD **50 Claims**

1. A compound of the formula:



wherein X^1 represents bromo, chloro or iodo; X^2 represents hydrogen, chloro or methyl; *n* represents an integer of 0 to 3, inclusive; R is ring-substituted in the 3-, 4- or 5-positions and each R independently represents hydrogen, trifluoromethyl, alkyl of from 1 to 3 carbon atoms, alkoxy of from 1 to 3 carbon atoms, bromo, chloro, fluoro or nitro, and T represents hydrogen,



3,972,914
NOVEL DERIVATIVES OF GLYCEROL

Guy Vanlerberghe, Montjay-la-Tour, and Henri Sebag, Paris, both of France, assignors to L'Oreal, Paris, France

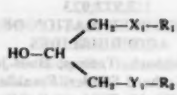
Filed Mar. 15, 1974, Ser. No. 451,593

Claims priority, application Luxembourg, Mar. 22, 1973, 67263

Int. Cl.² C11C *3/02;* **C07C** *69/30*

U.S. Cl. 260—496 **7 Claims**

1. A bi-substituted derivative of glycerol selected from the group consisting of those of the formula:



wherein one of the substituents X_1 and Y_1 is —O — and the other is

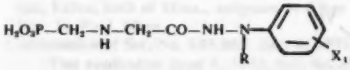
R_1 is a branched alkyl radical having from 5 to 8 carbon atoms, the number of carbons in the branch being 1, 2 or 3, and R_2 is a linear alkyl radical having from 11 to 18 carbon atoms, and mixtures thereof.

3,972,915
N-PHOSPHONOMETHYLGLYCINE PHENYL HYDRAZIDES

Gerhard H. Alt, Creve Coeur, and Robert W. Street, Kirkwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 14, 1974, Ser. No. 497,450
Int. Cl.² C07F 9/38; A01N 9/36
U.S. Cl. 260—502.5 **13 Claims**

1. A compound of the formula



wherein R is hydrogen, methyl or ethyl, *n* is zero, one or two, and X is methyl, nitro, chlorine or bromine.

3,972,916
DL-STRIGOLINTERMEDIATE

Charles J. Sih, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 450,950, March 13, 1974, Pat. No. 3,887,547. This application Dec. 13, 1974, Ser. No. 532,759
Int. Cl.² C07C 61/38
U.S. Cl. 260—514 G **1 Claim**

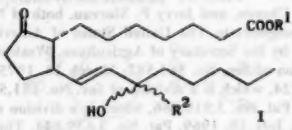
1. (±) 1,4-diketo-7,7-dimethyl-4,5,6,7-tetrahydroindane-2-acetic acid (7).

3,972,917
11-DEOXY 15-METHYL PROSTAGLANDIN E_1

Donald P. Strike, Philadelphia, Pa., assignor to American Home Products Corporation, New York, N.Y.

Continuation of Ser. No. 301,571, Oct. 27, 1972, abandoned. This application May 28, 1974, Ser. No. 473,604
Int. Cl.² C07C 61/38, 69/74
U.S. Cl. 260—514 D **3 Claims**

1. A chemical compound of the structure



wherein R^1 is hydrogen, alkyl of from 1 to 6 carbon atoms, alkali metal, or a pharmacologically-acceptable cation derived from ammonia or a basic amine, and R^2 is alkyl of from 1 to about 6 carbon atoms.

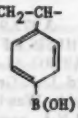
3,972,918
PROCESS FOR SEPARATING DOPA FROM TYROSINE

William L. Stanley, El Cerrito; Carl A. Elliger, Berkeley, and Bock G. Chan, Albany, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed June 28, 1974, Ser. No. 484,195
Int. Cl.² C07C 99/12
U.S. Cl. 260—519 **8 Claims**

1. A process for separating DOPA and tyrosine from a mixture of the same, which comprises —

a. applying the mixture of DOPA and tyrosine to a column containing particles of a solid polymer of *p*-vinylbenzene boronic acid, said particles having a mesh size in the range about 40–100 mesh, said polymer being a homopolymer containing repeating units of the structure —



b. eluting the column with buffered aqueous alkali having a pH of about 8 to 9 and collecting the resulting eluate containing solely tyrosine, and

c. eluting the column with dilute aqueous acid having a pH of about 2 to 4 and collecting the resulting eluate containing soley DOPA.

3,972,919
p-HYDROXYMETHYLPHENYLGLYCINE

George L. Dunn, Wayne, and John R. E. Hoover, Glenside, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Divisionof Ser. No. 359,566, May 11, 1973, Pat. No. 3,891,634, and a continuation-in-part of Ser. No. 289,499, Sept. 15, 1972, Pat. No. 3,855,213, said Ser. No. 359,566, is a continuation-in-part of Ser. No. 262,903, June 14, 1972, Pat. No. 3,867,380, which is a continuation-in-part of Ser. No. 116,598, Feb. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 99,296, Dec. 17, 1970, abandoned, said Ser. No. 289,499, is a continuation-in-part of Ser. Nos. 262,903, June 14, 1972, and Ser. No. 116,599, Feb. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 99,296,. This application Feb. 25, 1975, Ser. No. 552,915
Int. Cl.² C07C 65/22
U.S. Cl. 260—519 **1 Claim**

1. p-Hydroxymethylphenylglycine.

3,972,920
PROCESS FOR PRODUCING UNSATURATED ALDEHYDES, UNSATURATED FATTY ACIDS OR CONJUGATED DIENES

Hiromichi Ishii; Hideo Matsuzawa; Masao Kobayashi, all of Ohtake, and Kantaro Yamada, Yokohama, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed May 29, 1974, Ser. No. 474,218
Claims priority, application Japan, June 11, 1973, 48-65563; Aug. 28, 1973, 48-96345; Dec. 18, 1973, 48-142118; Dec. 26, 1973, 48-144000
Int. Cl.² C07C 51/24, 51/32
U.S. Cl. 260—531 R **8 Claims**

1. In a process for producing corresponding aldehydes, acids or conjugated dienes by gas phase catalytic oxidation of at least one compound selected from the group consisting of unsaturated hydrocarbons with 3 to 4 carbon atoms and t-butyl alcohol by using molecular oxygen at 200°–450°C, the improvement comprising: oxidizing said compound over a calcined catalyst consisting essentially of

$Mo_aSb_bBi_cFe_dNi_eSn_fX_gY_hO_i$

wherein X is at least one alkali metal selected from the group consisting of potassium, rubidium and cesium, Y is palladium, suffixes *a* to *h* are atomic ratios, wherein *a*=12, *b*=0.5 to 20, *c*=0.5 to 6, *d*=0.5 to 6, *e*=0.5 to 6, *f*=0 to 20, *g*=0.01 to 2 and *h*=0.01 to 3, and i is determined according to the state of oxidation of said catalyst.

3,972,921
SYNTHESIS OF RACEMIC 2-DEUTERO-3-FLUORO-ALANINE AND ITS SALTS

Ulf-H. Dolling; Edward J. J. Grabowski, both of Westfield; Erwin F. Schoenewaldt, Watchung, and Meyer Sletzinger, No. Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 8, 1974, Ser. No. 522,185
Int. Cl.² C07C 99/00, 101/10
U.S. Cl. 260—534 C **7 Claims**

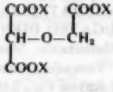
1. The process which comprises reacting an alkali metal or alkaline earth metal salt of 3-fluoro-pyruvic acid or hydrate thereof, with aqueous ammonium hydroxide until substantially converted to a salt of 2-imino-3-fluoro-propionic acid hydrate, and reacting the latter with an alkali metal borodeuteride to produce a salt of 2-deutero-3-fluoro-DL-alanine.

3,972,922
PROCESS FOR PREPARING ETHER TRICARBOXYLATES

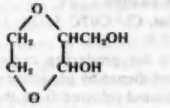
Russel D. Harken, Maryland Heights, and F. Wyman Morgan, Ballwin, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 18, 1974, Ser. No. 452,308
Int. Cl.² C01C 59/12
U.S. Cl. 260—535 P **3 Claims**

1. A process for making compounds represented by the formula



wherein X is alkali metal or hydrogen said process comprising oxidizing a compound represented by the formula



said oxidation being conducted utilizing an oxidizing agent having an oxidation potential at least equivalent to that of CrO_3.

3,972,923
PROCESS FOR THE PREPARATION OF PHOSPHONIC ACID DIHALIDES

Manfred Finke, Fischbach, Taunus; Hans-Jerg Kleiner, Bad Soden, Taunus; Gerhard Stühler, Frankfurt am Main, and Klaus Dehmer, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 262,203, June 13, 1972, abandoned, and Ser. No. 262,204, June 13, 1972, abandoned, and Ser. No. 262,205, June 13, 1972, abandoned. This application Nov. 13, 1973, Ser. No. 415,341
Claims priority, application Germany, Apr. 6, 1972, 2216565; Mar. 29, 1972, 2215314; June 15, 1971, 2129584; July 2, 1971, 2132962
Int. Cl.² C07F 9/42
U.S. Cl. 260—543 P **3 Claims**

1. A process for the preparation of phosphonic acid-dihalides of the formula

wherein R is alkyl of 1 to 18 carbon atoms, cycloalkyl of 4 to 8 carbon atoms, alkenyl of 2 to 18 carbon atoms, phenyl, phenalkyl or alkyl phenyl both containing a total of 7 to 8 carbon atoms, R may be substituted by chlorine, bromine, a cyano or a lower acyloxy group, and wherein X is halogen, which comprises reacting a phosphonic acid of the formula

wherein Y is oxygen, or the corresponding acid salt, phosphonic acid monoester and salt thereof, phosphonic acid ester halide, pyrophosphonic acid or pyrophosphonic acid ester with an acid halide of the formula

$(CO)_nX_2$

wherein X is chlorine or bromine and n is 1 or 2, in the presence of 0.01 to 0.2% by weight or from 0.2 to 5% by weight of a

1. compound containing at least one tri- to pentavalent nitrogen or phosphorus atom, which in the case of nitrogen is bound with 1 to 4, in the case of phosphorus with at least 3 valences to organic radicals having up to 20 carbon atoms, two of these valences optionally forming a double bond, or
2. mono-, di- or tribasic organic or inorganic fully amidated acid of tri- or pentavalent phosphorus, the N atoms of which optionally being substituted by aliphatic radicals having up to 20 carbon atoms, and the organic radicals of which contain up to 20 carbon atoms, if required, in the presence of an inert solvent.

3,972,924
1-(1H,1H-PERFLUOROOCYTYL)-1,3-TRIMETHYLENEDIPHOSPHONIC TETRACHLORIDE

Leon H. Chance, and Jerry P. Moreau, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 561,587, March 24, 1975, Pat. No. 3,937,724, which is a division of Ser. No. 151,507, June 9, 1971, Pat. No. 3,910,886, which is a division of Ser. No. 843,200, July 18, 1969, Pat. No. 3,639,144. This application Nov. 10, 1975, Ser. No. 630,375
Int. Cl.² C07F 9/38
U.S. Cl. 260—543 P **1 Claim**

1. 1-(1H,1H-perfluorooctyl)-1,3-trimethylenediphosphonic tetrachloride.

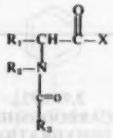
3,972,925

N-PERFLUOROACYL-AMINO ACIDS AND DERIVATIVES THEREOF

Rex W. Souter, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 29, 1974, Ser. No. 518,661
Int. Cl.² C07C *53/34*
U.S. Cl. 260—544 Y 5 Claims

1. A compound of the formula



wherein:
R_1 is methyl, isopropyl, or isobutyl;
R_2 is hydrogen;
R_3 is trifluoromethyl, pentafluoroethyl, or heptafluoropropyl; and
X is chlorine, bromine, or iodine.

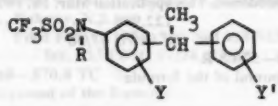
3,972,926

SUBSTITUTED TRIFLUOROMETHANESULFONANILIDES

George G. I. Moore, Birchwood, and Joseph Kenneth Harrington, Edina, both of Minn., assignors to Riker Laboratories, Inc., St. Paul, Minn.

Continuation of Ser. No. 103,803, Jan. 4, 1971, abandoned. This application June 1, 1972, Ser. No. 258,832
Int. Cl.² C07C *143/74*
U.S. Cl. 260—556 F 4 Claims

1. A compound of the formula



wherein R is hydrogen or a pharmaceutically acceptable cation and Y and Y′ are independently selected from hydrogen, lower alkyl, lower alkoxy, halogen and nitro.

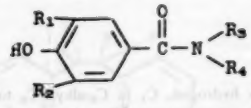
3,972,927

ALKYLAMIDES OF HINDERED 3,5-DIALKYL-4-HYDROXYBENZOIC ACIDS AND USE AS LIGHT STABILIZERS IN POLYOLEFINS

Peter Vincent Susi, Middlesex, and John Christian Oppelt, Somerville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 30, 1974, Ser. No. 537,153
Int. Cl.² C07C *103/26*
U.S. Cl. 260—559 R 6 Claims

1. A compound of the formula:



wherein R_1 and R_2 are each branched-chain alkyl of 3 to 8 carbon atoms and R_3 and R_4 are both alkyl of 8 carbon atoms, or cycloalkyl of 5 or 6 carbon atoms.

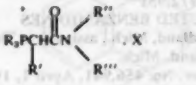
3,972,928

REGULATING PLANT GROWTH WITH QUATERNARY PHOSPHONIUM ALIPHATIC CARBOXAMIDE SALTS

Peter E. Newallis, Leawood, Kans., and Albert J. Poje, Grandview, Mo., assignors to Baychem Corporation, New York, N.Y.

Filed Nov. 15, 1971, Ser. No. 198,950
Int. Cl. C07c *103/30*
U.S. Cl. 260—561 P 9 Claims

1. Quaternary phosphonium carboxamide salts of the formula



(I)

wherein
R is alkyl of 1–14 carbons or dimethylamino,
R′ is hydrogen or lower alkyl;
R″ and R‴ each is hydrogen, alkyl of 1–14 carbon atoms, cycloalkyl of 3–7 carbon atoms, alkenyl of 2–6 carbon atoms, aralkyl having 1–4 carbon atoms in each corresponding alkyl moiety and optionally substituted with 1–3 chlorine atoms, phenyl, phenyl substituted with 1–3 chloro or 1–2 alkyl groups having 1–3 carbon atoms; and
X^- is a monovalent anion.

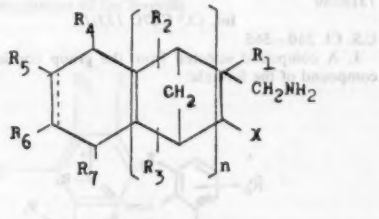
3,972,929

ALICYCLIC AMINO COMPOUNDS AND THEIR PRODUCTION

Noboru Kariya, Sakai, Japan, assignor to Nard Institute, Ltd., Japan

Filed Oct. 10, 1973, Ser. No. 405,162
Claims priority, application Japan, Oct. 11, 1972, 47-101702
Int. Cl.² C07C *87/40*, *87/28*
U.S. Cl. 260—563 P 6 Claims

1. An alicyclic amino compound of the general formula:



wherein R_1, R_2, R_3, R_4, R_5, R_6 and R_7 are each hydrogen, alkyl having 1 to 6 carbon atoms or phenyl; X is each hydrogen, alkyl having 1 to 6 carbon atoms or aminomethyl; n is an integer of 1 to 3; position indicated by a dotted line indicates the optional presence of a double bond.

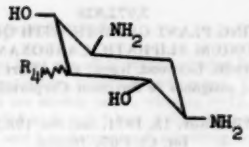
3,972,930

AMINOCYCLITOL ANTIBIOTICS

Sol J. Daum, Albany, and Robert L. Clarke, Bethlehem, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Feb. 18, 1975, Ser. No. 550,273
Int. Cl.² C07C *87/38*
U.S. Cl. 260—563 R 1 Claim

1. A compound having the formula:



where R_4 is fluorine or iodine.

3,972,931

N,N'-DISUBSTITUTED BENZAMIDINES

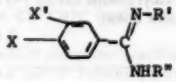
James R. McCarthy, Jr., Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 456,941, April 1, 1974, abandoned, which is a continuation of Ser. No. 279,651, Aug. 10, 1972, abandoned. This application Nov. 29, 1974, Ser. No. 527,989

Int. Cl.² C07C *123/00*

U.S. Cl. 260—564 R 6 Claims

1. A substituted amidine compound selected from the group consisting of halobenzamidine compounds corresponding to the formula



wherein X independently represents chloro or bromo and X' represents X or hydrogen, and R' and R'' each independently represent loweralkyl of one to three carbon atoms; and the pharmaceutically-acceptable salts thereof.

3,972,932

NOVEL 2,6-DISUBSTITUTED PHENYL-AMINOGUANIDINE COMPOUNDS

Harm Jan Panneman, Titus Brandsmalaan, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

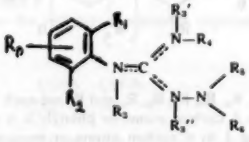
Filed Oct. 24, 1974, Ser. No. 517,554

Claims priority, application Netherlands, Nov. 9, 1973, 7315350

Int. Cl.² C07C *133/10*

U.S. Cl. 260—565 4 Claims

1. A compound selected from the group consisting of a compound of the formula:



and the pharmaceutically acceptable acid addition salts thereof, in which one double bond is present between the carbon atom of the guanidino moiety and one of the adjacent nitrogen atoms, and in which R_6 is selected from the group consisting of hydrogen, halogen, hydroxy, alkoxy containing from 1 to 6 carbon atoms, and alkyl containing from 1 to 6 carbon atoms;

R_1 and R_2 are selected from the group consisting of halogen, hydroxy, alkyl containing from 1 to 4 carbon atoms, and alkoxy containing from 1 to 4 carbon atoms;

R_3, R_3' and R_3'' are selected from the group consisting of hydrogen and alkyl containing from 1 to 4 carbon atoms, with the proviso that one of the substituents R_3, R_3' or R_3'' is absent because of the presence of the double bond;

R_4 is selected from the group consisting of hydrogen, alkyl containing from 1 to 4 carbon atoms, hydroxy, alkoxy containing from 1 to 4 carbon atoms, and amino optionally substituted with one or two alkyl groups containing from 1 to 4 carbon atoms;

R_5 and R_6 together represent an alkylidene group with 1–6 carbon atoms, a cycloalkylidene or cycloalkyl-alkylidene group with 5–12 carbon atoms or a phenylalkylidene group with 7–12 carbon atoms.

3,972,933

PREPARATION OF CARBODIIMIDES FROM UREAS BY DEHYDRATION

Ernest L. Lawton, Durham, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed May 28, 1974, Ser. No. 473,616

Int. Cl.² C07C *119/00*

U.S. Cl. 260—566 R 5 Claims

1. The method of producing biscarbodiimides by dehydrating bisureas with triethylamine, triphenylphosphine, and carbon tetrachloride.

3,972,934

3-SUBSTITUTED PHENYLALKYL AMINES

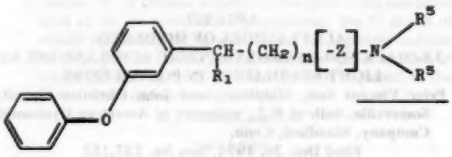
Winston S. Marshall, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 828,756, May 28, 1969, Pat. No. 3,600,437, which is a continuation-in-part of Ser. Nos. 823,477, May 9, 1969, abandoned, and Ser. No. 752,801, Aug. 15, 1968, abandoned. This application Mar. 10, 1971, Ser. No. 122,999

Int. Cl.² C07C *87/28*

U.S. Cl. 260—570.8 R 16 Claims

1. A compound of the formula



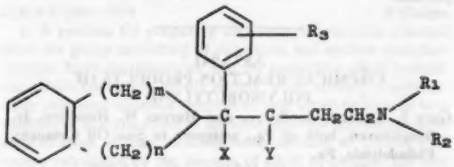
wherein R_1 is hydrogen, C_1 to C_8-alkyl, C_2 to C_8-alkenyl, C_2–C_8-alkynyl; *n* is an integer of from 1 to 3; and each R_5 is the same or different and is hydrogen, C_1 to C_8-alkyl, C_2 to C_8-alkenyl, cyclopropyl, or cyclopropylmethyl, allyl, 3-methyl-2-butenyl, or phenethyl; and the pharmaceutically acceptable acid addition salts thereof.

3,972,935
ANTIARRHYTHMIC AGENTS

Bryan B. Molloy, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed July 3, 1974, Ser. No. 485,488
Int. Cl.² C07C *87/28, 87/29*
U.S. Cl. 260—570 R 8 Claims

1. The compound of the formula



wherein:

m is 0, 1, or 2; *n* is 0, 1, or 2; *m* + *n* is 2 or 3;

R_1 and R_2 independently are hydrogen, C_1–C_4 alkyl, or lower alkenyl of the formula CH_3R_4, wherein R_4 is C_2–C_3 alkenyl;

R_3 is hydrogen, methyl, methoxy, trifluoromethyl, or halogen;

X and Y are both hydrogen, or taken together form a double bond; and

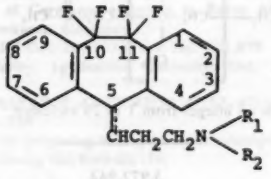
the pharmaceutically acceptable acid addition salts thereof.

3,972,936
10,11-DIHYDRO-5-(3-AMINO-PROPYL-OR-PROPYLIDENE)-10,10,11,11-TETRA-FLUORO-5H-DIBENZO[A,D]CYCLOHEPTENES AND-5-OLS

Marcia Elizabeth Christy, Perkasie, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 1, 1974, Ser. No. 438,923
Int. Cl.² C07C *87/28, 87/29*
U.S. Cl. 260—570.8 TC 10 Claims

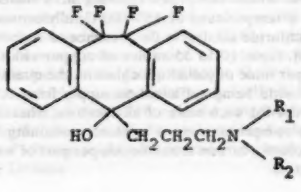
1. A compound of the formula:



in which

R_1 and R_2 can be alike or different and are either hydrogen, or alkyl of 1–6 carbon atoms, or wherein one to two of the hydrogen atoms attached to the 1-, 3-, 4-, 6-, 7-, or 9-positions is replaced by chlorine, fluorine, alkyl of 1–6 carbon atoms, alkoxy of 1–5 carbon atoms or trifluoromethyl.

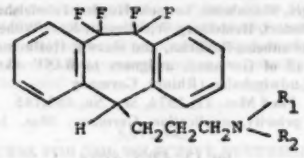
5. A compound of the formula:



in which

R_1 and R_2 can be alike or different and are either hydrogen, or alkyl of 1–6 carbon atoms, or wherein one to two of the hydrogen atoms attached to the 1-, 3-, 4-, 6-, 7-, or 9-positions is replaced by chlorine, fluorine, alkyl of 1–6 carbon atoms, alkoxy of 1–5 carbon atoms or trifluoromethyl.

7. A compound of the formula:



in which

R_1 and R_2 can be alike or different and are either hydrogen, or alkyl of 1–6 carbon atoms, or wherein one to two of the hydrogen atoms attached to the 1-, 3-, 4-, 6-, 7-, or 9-positions is replaced by chlorine, fluorine, alkyl of 1–6 carbon atoms, alkoxy of 1–5 carbon atoms or trifluoromethyl.

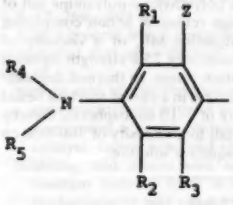
3,972,937
DIPHENYLAMINES FOR DYEING KERATINOUS FIBERS

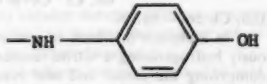
Gregoire Kalopissis, Paris; André Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 270,633, July 11, 1972, Pat. No. 3,853,464, which is a continuation-in-part of Ser. No. 61,833, Aug. 6, 1970, Pat. No. 3,792,090. This application Aug. 21, 1974, Ser. No. 499,189
Claims priority, application Luxemburg, Aug. 11, 1969, 59265; July 14, 1971, 63526
Int. Cl.² C07C *91/42*
U.S. Cl. 260—571 3 Claims

1. Diphenylamine selected from the group consisting of

a. a diphenylamine of the formula





wherein

Z represents a member selected from the group consisting of amino and acetylamino.

R_1, R_2, R_4 and R_5 each independently are selected from the group consisting of hydrogen and lower alkyl containing 1-4 carbon atoms and

R_3 is hydrogen, with the proviso that at least two of R_1, R_2, R_4 and R_5 are other than hydrogen when Z is amino, and

b. an acid salt of said diphenylamine.

3,972,938

MANUFACTURE OF HEXAMETHYLENE DIAMINE

Dieter Voges, Mannheim; Leopold Hupfer, Friedelsheim; Siegfried Winderl, Heidelberg-Wieblingen; Karl Wilhelm Leonhard, Bobenheim-Roxheim, and Herwig Hoffmann, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Mar. 11, 1974, Ser. No. 450,145

Claims priority, application Germany, Mar. 14, 1973, 2312591

Int. Cl.² C07C 87/14

U.S. Cl. 260—583 K 5 Claims

1. A process for the continuous manufacture of 1,6-hexamethylene diamine which comprises continuously hydrogenating adiponitrile in the presence of ammonia in liquid phase and hydrogen and in the presence of hydrogenation catalysts at a hydrogen partial pressure of from 20 to 300 atmospheres gage and a temperature of from 40° to 130°C, in a reaction zone, and continuously withdrawing and recycling the major portion of the hydrogenated reaction mixture leaving the reaction zone, wherein adiponitrile and ammonia are added to the recycled hydrogenated reaction mixture in a molar ratio of from 1:10 to 1:15, the amount of hydrogenated reaction mixture recycled being such that the overall molar ratio of adiponitrile to ammonia on entering the reaction zone is from 1:40 to 1:55.

3,972,939

PROCESS FOR THE PREPARATION OF POLYETHYLENE-POLYAMINE SALTS OF LOW VISCOSITY

Georg Spielberger, Leverkusen, and Knut Hammerström, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 9, 1974, Ser. No. 513,314

Claims priority, application Germany, Oct. 16, 1973, 2351754

Int. Cl.² C07C 85/00

U.S. Cl. 260—583 P 3 Claims

1. A process for preparing a polyethylene-polyamine salt of relatively low viscosity and high retention action comprising subjecting a polyethylene polyamine salt, of a viscosity of 900–10,000 cp at 25°C in substantially 25% strength aqueous solution and having high retention action, to thermal degradation by heating its aqueous solutions in a closed reaction vessel at 100°–180°C and at a pressure of 2–10 atmospheres, thereby reducing the viscosity of said salt to a viscosity of 300–600 cp at 25°C in substantially 25% aqueous solution.

3,972,940

CATALYST SUSPENSION FOAMING INHIBITION

Jewel C. Morgan, Jr., Cantonment, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 19, 1974, Ser. No. 534,386

Int. Cl.² C07B 1/00

U.S. Cl. 260—583 K 10 Claims

1. In a process in which an amine is prepared by continuously hydrogenating a nitrile reactant in a reaction medium comprising the amine and said reactant in a reaction zone maintained under hydrogenation conditions including a temperature of at least 60°C., molecular hydrogen and said reactant are continuously fed into said zone, a solid particulate Raney nickel or Raney cobalt hydrogenation catalyst is fed into said zone by suspending the catalyst in an aqueous liquid at a temperature below 50°C. and then feeding the resulting suspension into said zone, and said reaction medium and catalyst are withdrawn from said zone at rates that maintain essentially constant the proportions of reactant, catalyst and amine in said zone, and the amine is subsequently separated from the remainder of the reaction medium the improvement which comprises including in said aqueous liquid, prior to feeding the resulting suspension into said zone a portion of said withdrawn reaction medium containing an amount of said amine sufficient to substantially inhibit foaming of said suspension.

3,972,941

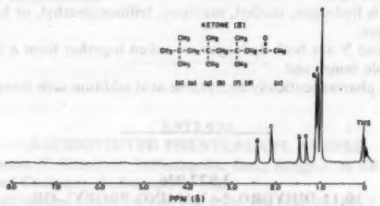
CHEMICAL REACTION PRODUCTS OF POLYISOBUTYLENE

Gary L. Driscoll, Boothwyn, and Marcus W. Haseltine, Jr., Brookhaven, both of Pa., assignors to Sun Oil Company, Philadelphia, Pa.

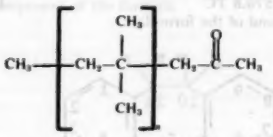
Filed Apr. 19, 1971, Ser. No. 135,295

Int. Cl.² C07C 49/06

U.S. Cl. 260—593 R 2 Claims



1. As a composition of matter a compound of the structural formula



wherein n is an integer from 1 to 29 inclusive.

3,972,942

OXIDATION OF ALLYLACETONE TO 2,5-HEXANEDIONE IN A WATER-CARBON TETRACHLORIDE SOLVENT SYSTEM

Ralph H. Lasco, Painesville, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Apr. 8, 1974, Ser. No. 458,474

Int. Cl.² C07C 45/00, 45/04

U.S. Cl. 260—593 R 7 Claims

1. A process for selectively oxidizing allylacetone to 2,5-hexanedione which comprises reacting in a mixed solvent system, at a temperature of 35°–100°C, allylacetone with a palladium chloride catalyst in the presence of copper chloride and oxygen, from 10 to 55 moles of copper chloride being employed per mole of palladium chloride, the quantity of said copper chloride being sufficient to supply from 0.1 to 10.0 moles thereof for each mole of allylacetone wherein the improvement comprises using a mixture containing from 1–3 parts, by volume, carbon tetrachloride per part of water as the solvent system.

3,972,943
PROCESS FOR PREPARING ALKALIACETYLACETONATES

Gerhard Klinstle, Raitenhaslach, and Herbert Siegl, Haiming, both of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Jan. 14, 1975, Ser. No. 540,782

Claims priority, application Germany, Jan. 18, 1974, 2402399

Int. Cl.² C07C *45/00*

U.S. Cl. 260—594 **5 Claims**

1. A process for preparing alkaliacetylacetonates selected from the group consisting of potassium and sodium acetylacetonate, from acetylacetone and the respective alkali hydroxide, which consists of slowly adding, while stirring, a substantially saturated aqueous solution of said alkali hydroxide to a solution of acetylacetone in acetone, wherein acetylacetone is present from at least stoichiometric amount to 10 mol% of excess calculated on the amount of alkali hydroxide, the rate of addition of said alkali hydroxide solution being so adjusted that the reaction temperature does not exceed 30°C, dissipating the generated reaction heat by cooling, separating the precipitated alkaliacetylacetonate formed in the reaction, rinsing with acetone, and drying.

3,972,944
PROCESS FOR PREPARING ALDEHYDES FROM OLEFINS

Helmut Waldmann, Leverkusen; Wulf Schwerdtel, Leverkusen-Steinbuechel, and Wolfgang Swodenk, Odenthal-Globusch, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

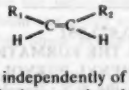
Filed Oct. 26, 1973, Ser. No. 410,075

Claims priority, application Germany, Oct. 27, 1972, 2252674

Int. Cl.² C07C *47/52, 47/54, 47/12, 47/28*

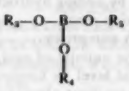
U.S. Cl. 260—599 **12 Claims**

1. Process for preparing aldehydes which comprises reacting an olefin having the formula (I);



(I)

wherein R_1 and R_2 independently of one another are selected from the group of hydrogen; phenyl optionally substituted by fluorine, C_1-C_6 alkoxy or C_1-C_6alkyl; linear or branched C_1-C_{18}-alkyl optionally substituted by fluorine, —OH, C_1-C_6 alkoxy, carbo- C_1-C_3 -alkoxy or phenyl; or the radicals R_1 and R_2 together with the C-atoms of the C=C-double bond can represent a carbocyclic ring with up to 24 carbon atoms optionally substituted by fluorine, C_1-C_6-alkyl, C_5-C_7 -cycloalkyl or phenyl, with a non-aqueous solution of hydrogen peroxide in a solvent selected from the group of esters, N-alkyl-substituted acid amides, alcohols, carboxylic acids, sulfonic acids and phosphoric acids, at temperatures in the range of from −80°C to +50°C in the presence of a boron compound selected from the group of a boron oxide, a boric acid and a boric acid ester having the formula



wherein R_3, R_4 and R_5 independently of one another represent C_1-C_6-alkyl, C_5-C_7-cycloalkyl, or phenyl, and at least one vanadium (II) or (III) or molybdenum (II) or (III) acetate, benzoate, acetyl acetonate or naphthenate, said boron compound being present in quantities of from 10 to 50 mol percent based on the quantity of hydrogen peroxide used and said vanadium or molybdenum compound being present in quantities of less than 10 mol present based on the quantity of hydrogen peroxide used.

3,972,945
PROCESS FOR THE SELECTIVE SYNTHESIS OF SALICYLALDEHYDES

Charles F. Albright, Granada Hills, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 23, 1974, Ser. No. 535,895

Int. Cl.² C07C *45/00*

U.S. Cl. 260—600 R **26 Claims**

1. A process for the preferential preparation of a salicylaldehyde with negligible formation of the corresponding 4-hydroxybenzaldehyde comprising reacting a phenol with an alkali metal hydroxide and chloroform, said reaction being carried out with agitation at elevated temperatures of about 50° to 150°C., under reflux conditions in a substantially non-aqueous reaction zone, the water of reaction being removed by formation of a concentrated alkali metal hydroxide solution upon reaction with excess alkali metal hydroxide, the reaction being carried out in a hydrocarbon diluent and catalyzed by an effective concentration of a catalyst selected from the group consisting essentially of N,N-dimethylformamide, N,N-dimethylacetamide, and dimethyl sulfoxide.

3,972,946
CATALYST ACTIVITY CONTROL IN PROCESS FOR CONVERTING AN ALKENE TO A CARBONYL DERIVATIVE IN THE PRESENCE OF A NOBLE METAL AND REDOX AGENT

Shinya Ochiai, and Leonard Griffith, both of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Sept. 22, 1971, Ser. No. 182,774

Int. Cl.² C07C *45/02*

U.S. Cl. 260—604 AC **10 Claims**

1. In a process which comprises converting an alkene to an oxygenated derivative thereof, which process comprises the step of:

passing said alkene through an elongated tubular reaction zone cocurrently with an acidic oxidant catalyst solution comprising a liquid containing a noble metal oxidation catalyst, cupric ions, and chloride ions;

oxidizing said alkene with said catalyst solution in said reaction zone to form a reaction product comprising predominantly said oxygenated derivative admixed with said catalyst solution in a chemically reduced condition;

separating said reaction product into fractions comprising (a) an oxygenated product fraction and (b) a reduced catalyst solution fraction containing said noble metal and copper in a reduced form;

reoxidizing said reduced catalyst solution with a gas comprising molecular oxygen to oxidize the copper values contained therein to the cupric form; and

recycling the resulting reoxidized catalyst solution to said elongated reaction zone for the oxidation of additional quantities of said alkene;

said process being characterized by continuous depletion of the chloride content of said catalyst solution through formation of chlorinated reaction by-products, making necessary the replenishment of the chloride content of

said catalyst solution by adding hydrochloric acid thereto prior to said reoxidation step;

the improvement which comprises:

maintaining the catalytic activity of said oxidation catalyst solution at an optimal level by continuously monitoring the internal pressure gradient obtaining within said reactor at a given rate of discharge of said reaction product therefrom and

adjusting the rate of addition of said hydrochloric acid into said catalyst solution, in response to fluctuations in said pressure gradient, to such a level as to maintain said pressure gradient substantially constant and at a level characteristic of said reactor when its interior is free of solid foulants.

3,972,947
PROCESS FOR THE PREPARATION OF CHLOROMETHYL METHYL ETHER

Leonard M. Weinstock, Belle Mead; Sandor Karady, Mountainside, and Meyer Sletzinger, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 439,676, Feb. 4, 1974, abandoned. This application July 15, 1975, Ser. No. 596,559

Int. Cl.² C07C *41/00*

U.S. Cl. 260—614 R **6 Claims**

1. A process for preparing chloromethyl methyl ether comprising reacting, at a temperature of from about 0° to about 100°C., in a sealed vessel under anhydrous conditions, methylal and an acid chloride wherein the acid chloride is selected from the group consisting of alkyl acid chlorides, aryl acid chlorides, aralkyl acid chlorides, thionyl chloride, sulfuryl chloride, phosphorous trichloride, phosphorous pentachloride, phosphorous oxychloride and phosgene; wherein the methylal is present from about 3 to about 5 mole % excess relative to the acid chloride, in the presence of an initial quantity of a substance selected from the group consisting of HCl and lower alkanol having from 1 to about 5 carbon atoms; wherein the initial quantity of HCl or lower alkanol is from about 0.1 to about 10% of the initial concentration of methylal.

3,972,948
ANHYDROUS CATALYST FOR MANUFACTURE OF GLYCOL ETHERS

George Joseph Laemmle, Port Arthur, and Kenneth Carol Rightmer, Nederland, both of Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

Filed Nov. 29, 1974, Ser. No. 528,425

Int. Cl.² C07C *41/02*, *41/10*

U.S. Cl. 260—615 R **8 Claims**

1. In the method for the preparation of mono- and polyglycol ethers comprising the steps of mixing and catalytically reacting an alkylene oxide containing 2 to 4 carbon atoms and an alcohol comprising a saturated aliphatic monohydric alcohol having from 1 to 4 carbon atoms in the presence of a catalyst containing alkali or alkaline earth cations at a temperature within the range of about 50° to about 350°C. under a pressure of about 30 to about 3,000 psig and then separating the desired mono- and poly-glycol ethers from the liquid reaction product effluent, the improvement comprising:

employing as said catalyst an anhydrous high boiling liquid residue containing catalytically active alcoholates of alkali or alkaline earth metals prepared in said process for the production of said desired mono- and poly-glycol ethers by concentrating the liquid residue of said reaction product effluent after said desired mono- and poly-glycol ethers have been separated therefrom.

3,972,949
PROCESS FOR PREPARING GLYCOL DIMETHYL ETHERS

Hans-Jürgen Arpe, Fischbach, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 14, 1975, Ser. No. 595,732

Claims priority, application Germany, July 16, 1974, 2434057

Int. Cl.² C07C *41/00*

U.S. Cl. 260—615 R **3 Claims**

1. Process for preparing glycol dimethyl ethers of the formula $CH_3O(CH_2CH_2O)_nCH_3$, wherein n is an integer from 1 to 8, from a formal of the corresponding glycol monomethyl ethers, which comprises reacting the formals with hydrogen under a pressure of 30 to 300 bars and at a temperature of 50° to 250°C in the presence of a catalyst comprising silicon dioxide and either aluminum oxide or an oxide of a rare earth or a combination of the aforesaid three components and containing additionally the metals nickel, cobalt or copper.

3,972,950
PROCESS FOR THE PURIFICATION OF BISPHENOL A

Arien Kwantes, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed May 7, 1975, Ser. No. 575,277

Claims priority, application Netherlands, Aug. 14, 1974, 7410872

Int. Cl.² C07C *37/22*

U.S. Cl. 260—619 A **5 Claims**

1. A process for the purification of a crude 2,2-bis(4-hydroxyphenyl)propane mixture prepared by condensing phenol with acetone or 2,2-dimethyl-1,3-dioxolane, said mixture being substantially free of phenol, which process comprises:

a. dissolving the crude 2,2-bis(4-hydroxyphenyl)propane and impurities in a polyhydroxy solvent selected from alkane diols and alkane triols;

b. contacting the polyhydroxy solvent-crude 2,2-bis(4-hydroxyphenyl)propane solution with water and an ether selected from the group consisting of diethyl ether, ethyl-*n*-propyl ether, ethylisopropyl ether, methyl-tert-butyl ether, di-*n*-propyl ether, diisopropyl ether and furan, wherein said ether extracts the 2,2-bis(4-hydroxyphenyl)-propane;

c. separating the ether-2,2-bis(4-hydroxyphenyl)propane extract;

d. distilling the ether-2,2-bis(4-hydroxyphenyl)propane extract in a column and in the presence of toluene and recovering as bottoms product a toluene-2,2-bis(4-hydroxyphenyl)propane solution;

e. cooling the toluene-2,2-bis(4-hydroxyphenyl)propane bottoms product to form a purified 2,2-bis(4-hydroxyphenyl)propane precipitate; and

f. recovering the purified 2,2-bis(4-hydroxyphenyl)propane.

3,972,951
PROCESS FOR THE FORMATION OF 2,6-DIPHENYL-PHENOL

Robert S. Kapner, Loudonville, N.Y.; Donald L. Kippax, West Stockbridge, Mass.; Kevin E. Murphy, and Lalitkumar H. Udani, both of Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 601,771, Dec. 14, 1966, abandoned. This application Mar. 8, 1971, Ser. No. 122,078

Int. Cl.² C07C *37/06*

U.S. Cl. 260—620 **6 Claims**

1. In a process for the preparation of 2,6-diphenylphenol, the steps comprising:

a. passing a reaction mixture consisting of an aqueous alkaline catalyst and a cyclic ketone selected from the group consisting of cyclohexanone and mixtures thereof with bicyclic condensation products of cyclohexanone succes-

sively through at least two condensation reactors in a condensation reactor zone wherein the reaction temperature is from 150° to 200°C.;

b. removing said condensation product from said reactor zone when it contains a maximum of 70% of tricyclic ketones by weight;

c. collecting and condensing the vapors above the condensation reactors in the reactor zone and passing the same to a decantor wherein a water phase and a cyclohexanone phase is formed;

d. separating said cyclohexanone phase from the water phase and recycling said cyclohexanone phase to the first condensation reactor in said reaction zone whereby it acts as a source of cyclohexanone and as a solvent for the reaction mixture;

e. cooling said condensation product as it leaves said reaction zone;

f. passing said condensation product to a neutralizer and neutralizing by adding an acid to form an aqueous phase and an organic phase;

g. separating said organic phase from said aqueous phase;

h. passing said organic phase through a first distillation column to remove water, a second distillation column to remove bicyclic autocondensation products of cyclohexanone which are recycled to the first condensation reactor, and a third distillation column to separate an isomeric mixture of tricyclic ketones from the remainder of the organic phase;

i. passing said isomeric mixture of tricyclic ketones through a dehydrogenation catalyst in a fixed bed dehydrogenation reactor maintained at a temperature from 240° to 360° C. to produce a mixture of 2,6-diphenylphenol and partially dehydrogenated by-products; and

j. recovering 2,6-diphenylphenol from said mixture.

3,972,952

VAPOR-PHASE CONVERSION OF METHANOL AND ETHANOL TO HIGHER LINEAR PRIMARY ALCOHOLS BY HETEROGENEOUS CATALYSIS

Roger T. Clark, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 14, 1975, Ser. No. 558,524

Int. Cl.² C07C *29/00*

U.S. Cl. 260—642 R **11 Claims**

1. A process for the vapor-phase conversion of a lower alcohol selected from the group consisting of methanol and ethanol to a higher linear primary alcohol, which process comprises:

contacting said lower alcohol, in vapor form and admixed with a carrier gas which is a mixture of hydrogen and carbon monoxide, with a solid particulate catalyst comprising: (a) between about 85 and 97 percent by weight of an inert support material comprising alumina; (b) between about 2 and 14 percent by weight of a base promoter selected from the group consisting of oxides, hydroxides, and basic salts of alkali and alkaline earth metals; and (c) between about 0.1 and 1 percent by weight of a catalyst metal which is a member of the group consisting of ruthenium, rhodium, palladium, osmium, iridium, and platinum;

said contacting being carried out at a temperature of about 200° to 400°C, under a pressure between about 1000 and 5000 psig, and at a space velocity between about 2,000 and 10,000 hr^{-1}.

3,972,953

GROUP VIII METAL COMPLEX CATALYZED HALOGEN EXCHANGE REACTION

James E. Lyons, Wallingford, Pa., assignor to Sun Ventures, Inc., St. Davids, Pa.

Filed Jan. 22, 1975, Ser. No. 542,998

Int. Cl.² C07C *17/20*

U.S. Cl. 260—651 R **9 Claims**

1. A process for the exchange of halogen moieties between two or more lower alkyl halides or aryl-substituted alkyl halides to form corresponding halophydrocarbons having different halogen moieties, or mixed halohydrocarbons, or both, which comprises contacting at least two such alkyl halides, where the halogen moieties on each differ from each other, in the liquid phase, in the presence of a low valent, coordinatively unsaturated d^8 or d^6 Group VIII metal complex catalyst of the formula

$$M^aX_nL_x$$

wherein M is ruthenium, rhodium osmium, iridium or cobalt; X is chloride, bromide, or iodide; L is a neutral ligand selected from the group consisting of CO; and trialkyl- or triaryl- or mixed alkylaryl-phosphines; n is 1 or 2; x is an integer of from 2 to 4; and wherein said neutral ligands may be the same or different.

3,972,954

PROCESS FOR OXIDATIVE DEHYDROGENATION

Brent J. Bertus, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 226,299, Feb. 14, 1972, abandoned. This application Apr. 8, 1974, Ser. No. 458,721

Int. Cl.² C07C *5/48*

U.S. Cl. 260—680 E **9 Claims**

1. An oxidative dehydrogenation process wherein at least one dehydrogenatable monoolefinic hydrocarbon compound containing at least one

grouping is dehydrogenated under oxidative dehydrogenation conditions in admixture with molecular oxygen to products comprising hydrocarbons of a higher degree of unsaturation as compared to said dehydrogenatable monoolefinic hydrocarbon compound, which process comprises

contacting said dehydrogenatable monoolefinic hydrocarbon compound with a catalyst composition consisting of, exclusive of support, (I) about 15 to 65 weight percent nickel, (II) about 10 to 40 weight percent molybdenum, (III) about 1 to 25 weight percent phosphorus, and (IV) oxygen, or oxygen and sulfur, wherein the weight percent of each of said components is in a ratio of each to the other sufficient to provide catalytic effectiveness for said composition in said oxidative dehydrogenation process.

3,972,955

PROCESS FOR PREPARATION OF ISOPRENE

Kurt Halcour, Leverkusen; Paul Losacker, Leichlingen; Wulf Schwerdtel, Leverkusen-Steinbuechel, and Wolfgang Swodenk, Odenthal-Gloebusch, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 13, 1974, Ser. No. 505,894

Claims priority, application Germany, Sept. 22, 1973, 2347841

Int. Cl.² C07C *1/20*

U.S. Cl. 260—681 **14 Claims**

1. In a process for the preparation of isoprene, which comprises reacting isobutene with formaldehyde in an aqueous medium, in a first stage to form 4,4-dimethyl-m-dioxane, and

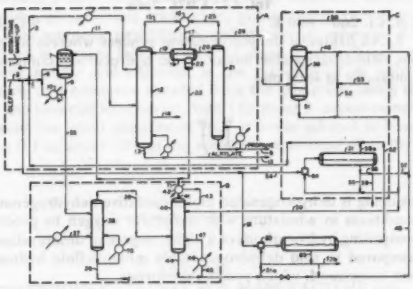
an aqueous phase containing formaldehyde, and, in a second stage, decomposing the 4,4-dimethyl-m-dioxane to form isoprene and an aqueous phase containing formaldehyde, at least one of said aqueous phases containing high boiling impurities and at least one of said aqueous phases containing impurites which are readily volatile constituents, the improvement which comprises combining the aqueous phases containing formaldehyde formed in said first and second stages, distilling the resulting material to separate the higher-boiling constituents as a sump product and aqueous formaldehyde containing the readily volatile impurities as distillate, extracting the distillate with a stream of C_4-hydrocarbons, containing isobutene to remove the readily volatile constituents, feeding the stream of C_4-hydrocarbons leaving the extraction into the first reaction stage, and mixing the extracted aqueous formaldehyde solution with an alkaline material or conducting it over a basic ion exchanger, at some point after said distillation, rectifying the resulting solution to produce substantially all the formaldehyde as head product, and an aqueous effluent substantially free from formaldehyde as sump product.

3,972,956

AVOIDING POLLUTION BY HF CATALYST RESIDUES IN ALKYLATION

Cecil O. Carter, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 392,233, Aug. 28, 1973, Pat. No. 3,886,220. This application Apr. 11, 1975, Ser. No. 567,338
Int. Cl.² C07C *3/54*
U.S. Cl. 260—683.48 **6 Claims**



1. An alkylation process which comprises:

a. reacting at least one isoparaffin with at least one olefin in the presence of an HF acid catalyst to produce an alkylation effluent,

b. separating said effluent into an HF acid catalyst phase and a hydrocarbon phase,

c. fractionating said hydrocarbon phase to recover alkylate and a vent gas stream comprising noncondensible gases lighter than propane including HF,

d. passing said vent gas stream to a scrubbing zone,

e. subjecting said HF acid catalyst phase to stripping with a hydrocarbon stripping medium under conditions to remove HF from said catalyst phase and to recover a stream comprising condensed water containing HF, and

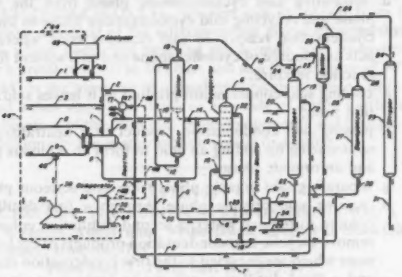
f. passing said condensed water containing HF from step (e) to said scrubbing zone and therein scrubbing said vent gas stream with said water containing HF to separate a vent gas stream free from HF and yielding an HF-enriched water-containing HF stream from said scrubbing zone.

3,972,957

HF ALKYLATION REACTION TEMPERATURE CONTROL SYSTEM

Robert F. Zabransky, Oak Brook, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 534,398, Dec. 19, 1974, which is a continuation-in-part of Ser. No. 468,956, May 10, 1974, abandoned. This application June 20, 1975, Ser. No. 588,999
Int. Cl.² C07C *3/54*
U.S. Cl. 260—683.48 **6 Claims**



1. A process for alkylating an isoparaffin with an olefinic feed stream, containing at least two olefins, which process comprises the steps of:

a. reacting said isoparaffin with said feed stream, in admixture with a hydrogen fluoride catalyst, in an alkylation reaction zone, at alkylating conditions resulting in a reaction product effluent containing normally liquid alkylate;

b. regulating the temperature of the reaction mixture, within said reaction zone, through indirect contact therein with a cooling medium, the flow of which is adjusted by flow-varying means;

c. introducing a sample of said olefinic feed stream into a first hydrocarbon analyzer and developing therein a first process output signal representative of a composition characteristic of said olefinic feed stream;

d. sensing a temperature of said reaction zone and developing a second process output signal representative thereof;

e. recovering said normally liquid alkylate from said product effluent;

f. introducing a sample of said alkylate into a second hydrocarbon analyzer and developing therein a liquid process output signal representative of a composition characteristic of said sample;

g. transmitting said three process output signals to computer/comparator means and developing therein a computer output signal in response to, and as a function of said three process output signals; and,

h. transmitting said computer output signal to said flow-varying means, whereby the flow of said cooling medium is adjusted in response thereto.

3,972,958

CONVERSION OF COAL TO HIGH OCTANE GASOLINE

William E. Garwood, Haddonfield; Solomon M. Jacob; James C. Kuo, both of Cherry Hill, all of N.J., and John J. Wise, Media, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 8, 1975, Ser. No. 566,153
Int. Cl.² C07C *3/54, 27/06*
U.S. Cl. 260—683.49 **4 Claims**

1. A process of converting coal to gasoline comprising:

a. reacting coal with oxygen and water at about 1450° to 1800°F to produce a synthesis gas product comprising carbon oxides, hydrogen and methane;

b. catalyzing the conversion of said synthesis gas product from step (a) to form a product comprising water, C_4^- gas and C_5^+ liquid hydrocarbons with a catalyst comprising a

crystalline aluminosilicate zeolite having a silica to alumina ratio of at least 12 and a constraint index of 1 to 12;

c. separating a gasoline fraction containing aromatic components therein from said liquid hydrocarbons of step b;

d. separating said C_4^- gas into a C_3^- tail gas comprising methane, ethane and ethylene, and an alkylation feed comprising saturated and unsaturated C_3 and C_4 hydrocarbons;

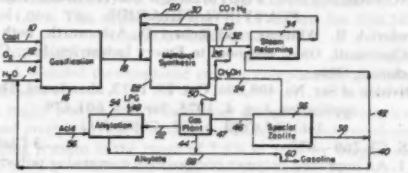
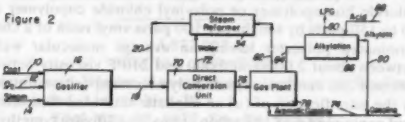


Figure 2



e. alkylating said alkylation feed in contact with a strong alkylation acid to a reaction temperature up to about 450°F and up to about 500 psig;

f. separating C_7 and C_8 alkylate from step (e) and admixing said alkylate with said gasoline from step (c);

g. steam reforming said C_3^- tail gas from step (d) to form an auxiliary synthesis gas comprising carbon oxides and hydrogen; and

h. admixing said auxiliary synthesis gas from step (g) with said coal gasification gas from step (a) prior to conversion thereof in step (b).

3,972,959

PROCESS FOR PREPARING PHENOLIC FILAMENTS

Hiroaki Koyama, Osaka, Japan, assignor to Nippon Kynol Inc., Osaka, Japan

Filed Oct. 22, 1974, Ser. No. 517,029

Claims priority, application Japan, Oct. 24, 1973, 48-119673

Int. Cl.² D06M *13/12, 13/16, 13/20*

U.S. Cl. 260—841 **13 Claims**

1. A process for producing melt-spun and cured phenolic filaments consisting essentially of a novolak resin in an amount of more than 50% by weight based on the total weight of the filaments and a fiber-forming thermoplastic synthetic resin in an amount of less than 50% by weight based on the total weight of the filaments and having improved tenacity and whiteness, which comprises contacting cured phenolic filaments with a treating agent in the vapor or liquid phase, said treating agent containing at least 25% by weight of at least one member selected from the group consisting of alcohols containing from 1 to 6 carbon atoms, acetone and mixtures thereof, the filaments being contacted with the treating agent before or during the drawing of the filaments, and reacting the thus-treated phenolic filaments with an esterifying solution containing at least 30% by weight of acetic anhydride as an esterifying agent and 0.3 to 20% by weight of an inorganic acid of phosphorus as an esterifying catalyst at a temperature of about 90° to 140°C. to esterify the phenolic hydroxyl or methylol groups of said novolak resin in the filaments.

3,972,960

HEAT-STABLE POLYIMIDE RESIN MODIFIED BY UNSATURATED POLYESTER

Michel Bargain, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

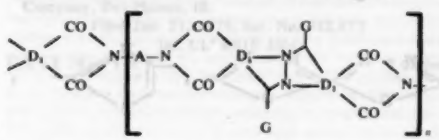
Division of Ser. No. 228,233, Feb. 22, 1972. This application Mar. 5, 1974, Ser. No. 448,263

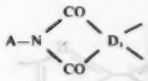
Claims priority, application France, Feb. 24, 1971, 71.06288

Int. Cl.² C08L *77/00*

U.S. Cl. 260—857 PE **19 Claims**

1. A heat-stable cured resin which consists essentially of three-dimensional recurring units of the general formula:

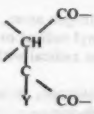




in which, in any particular recurring unit

a is zero or an integer from 1 to 5;

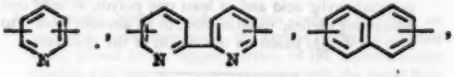
denotes a radical of the general formula:

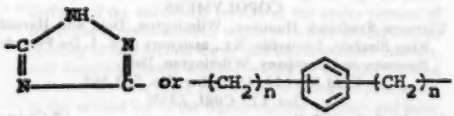


in which Y represents H, CH_3 or Cl;

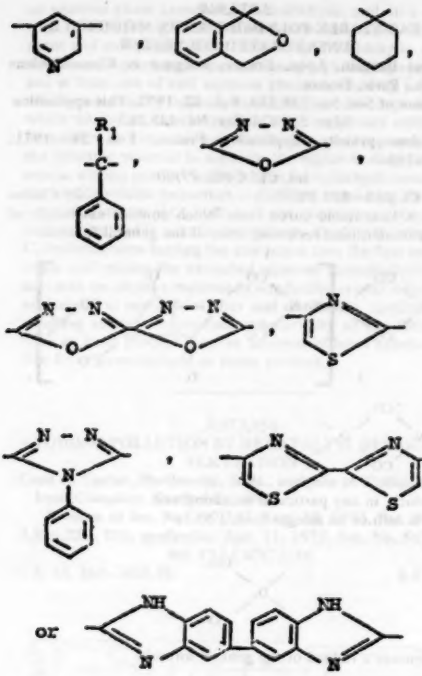
G denotes a monovalent carbocyclic aromatic radical; and

A denotes an alkylene radical having less than 13 carbon atoms, a phenylene or cyclohexylene radical or one of the radicals of the formulae:





wherein *n* represents an integer from 1 to 3, or a divalent radical having 12 to 30 carbon atoms consisting of phenylene or cyclohexylene radicals linked to one another by a simple valency bond or by —O— or —S—, an alkylene group with 1 to 3 carbon atoms, —CO—, $-SO_2-$, $-NR_1-$, —N=N—, —CONH—, —COO—, $-P(O)R_1-$, —CONH—X—NH-CO—.



wherein R_1 represents a hydrogen atom, an alkyl radical with 1 to 4 carbon atoms, a phenyl radical or a cyclohexyl radical and X represents an alkylene radical with less than 13 carbon atoms,

such that there are, on average, at least 4.4 and at most about 20 $>D_1<$ radicals per

radical and which is modified by the addition, before curing of the resin, of an unsaturated polyester of at least one polycarboxylic acid and at least one polyol, at least one containing olefinic unsaturation, in an amount from 5 to 50% by weight based on the weight of the reactants.

3,972,961

PROCESS FOR THE PREPARATION OF GRAFT COPOLYMERS

Clarence Frederick Hammer, Wilmington, Del., and Harold King Sinclair, Louisville, Ky., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 13, 1974, Ser. No. 523,468

Int. Cl.² C08L *77/00*

U.S. Cl. 260—857 G **67 Claims**

1. Process for the preparation of thermoplastic graft copolymers which comprises heating for about 15 seconds to 60 minutes, with mixing, (1) a trunk copolymer of at least two monomers, at least one of said monomers providing amine-reactive sites aken from the group consisting of an anhydride group, a vicinal pair of carboxylic groups and a carboxylic group adjacent to an alkoxycarbonyl group, wherein the alkoxy group contains up to 20 carbon atoms, and at least one of said monomers containing no aminereactive sites, and (2) at least one side chain polymer ranging in length from about 25 to 1000 chain atoms, having per chain one active amine site taken from the group consisting of primary and secondary amines, the remainder of said side chain polymer being substantially unreactive with the reactive sites of the trunk copolymer.

3,972,962

NON-MIGRATING POLYMERIC PLASTICIZERS FOR POLYVINYL CHLORIDE

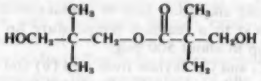
Frederick R. Williams, and Robert D. Aylesworth, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Division of Ser. No. 408,696, Oct. 23, 1973, abandoned. This application Aug. 4, 1975, Ser. No. 601,479

Int. Cl.² C08L *67/02;* **C08K** *5/11*

U.S. Cl. 260—873 **3 Claims**

1. An improved polymer composition comprising polyvinyl chloride homopolymer or polyvinyl chloride copolymer and 10 to 150 parts by weight per 100 parts vinyl resin of a chain-terminated polyester having an average molecular weight between about 2,000 and 5,000 and 210°F viscosity between 200 and 250 centistokes, said polyester composition obtained by the esterification of (a) an aliphatic saturated dicarboxylic acid containing 6 to 10 carbon atoms, (b) 2-hydroxymethyl-2-methylpropyl-2-hydroxymethyl-2-methylpropionate having the structural formula



and (c) about 2 to 15 mole percent, based on the total acids of an aromatic monocarboxylic acid containing from 7 to 20 carbon atoms.

3,972,963

ORGANIC REINFORCING FILLERS FOR RUBBER

Frederick C. Schwab, Metuchen, and James G. Murray, East Brunswick, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 371,645, June 20, 1973, abandoned. This application July 18, 1975, Ser. No. 597,851

Int. Cl.² C08L *9/06*

U.S. Cl. 260—880 B **15 Claims**

1. A process for producing an organic reinforcing filler for rubber that consists essentially of slurry polymerizing a reaction mixture comprising styrene, divinylbenzene, and an anionic polymerization initiator dispersed in a liquid aliphatic hydrocarbon slurrying medium in presence of from about 0.1 to about 10 weight percent based upon the styrene reactant of an AB block polymer dispersant of styrene and t-butylstyrene styrene and butadiene, or styrene and isoprene to produce a finely divided solid cross-linked polymer, said anionic polymerization initiator comprising (1) butyllithium, sec-butyllithium, amyllithium, ethyllithium, butylsodium, sec-butylsodium, amylsodium or ethylsodium (2) an alkali metal-bearing unsaturated hydrocarbon polymer that initiates polymerization of styrene while providing in the resulting finely-divided polymer groups reactive with rubber in rubber cure, or (3) a mixture of (1) and (2) said process being further characterized in that when carried out with an initiator defined in (1) the slurry polymerization is terminated with carbonyl sulfide, propylene sulfide, N-oxydiethylene-benzothiazole-2-sulfenamide, benzothiazyl disulfide, or dipentamethylene thiuram hexasulfide to impart thereto groups reactive with rubber in a rubber cure operation and, when said process is carried out with an initiator as defined in (2) or (3), the slurry polymerization is optionally terminated with carbonyl sulfide, propylene sulfide, N-oxydiethylene-benzothiazole-2-sulfenamide,

benzothiazyl disulfide, or dipentamethylene thiuram hexasulfide to impart thereto additional groups reactive with rubber in a rubber cure operation.

3,972,964

COATING COMPOSITION FOR POLYETHYLENE FILMS COMPRISING EPR AND POLYBUTENE

Donald J. Doentremont, Greenville, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Division of Ser. No. 428,541, Dec. 12, 1973, Pat. No. 3,891,008. This application Mar. 7, 1975, Ser. No. 556,245
Int. Cl.² C08L *23/16*
U.S. Cl. 260—897 A **4 Claims**

1. A blended thermoplastic coating composition consisting essentially of:

a. a major portion which comprises a copolymer of ethylene and propylene, the ethylene constituent of said copolymer being present in the range of 2.5% to 10% by weight; and

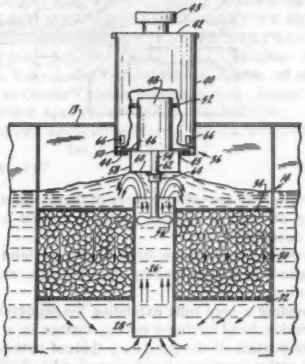
b. a minor portion which comprises polybutene-1.

3,972,965

SPECIAL AERATOR

Robert Brown Higgins, Lenexa, Kans., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Filed Mar. 10, 1975, Ser. No. 556,592
Int. Cl.² B01F *3/04*
U.S. Cl. 261—91 **5 Claims**



1. In combination with an enclosed tank containing liquid to be aerated, an improved mechanical aerator; comprising:

a. draft tube means extending down into the liquid within said tank;

b. shaft means extending downward into said draft tube means;

c. propeller means mounted for rotation on said shaft means within the upper end of said draft tube means for pumping said liquor upward through said draft tube means and lifting said liquid above the surface of the liquid within said tank;

d. an enclosed chamber extending downward into said tank;

e. air inlet means located in an upper portion of said chamber;

f. air outlet means located in a lower portion of said chamber in communication with an upper portion of said tank;

g. motor assembly means mounted within said chamber for rotating said shaft means and for drawing air into said chamber through said air inlet means and through an upper portion of said motor assembly means and out through a lower portion of said motor assembly means to be directed through said air outlet means into said tank; and

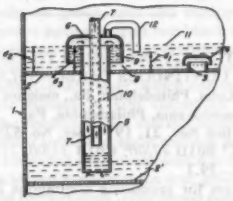
h. seal means extending between said motor assembly means and said chamber between said upper and lower portions of said motor assembly means for precluding air from below said seal means to be drawn into said motor assembly means.

3,972,966

APPARATUS FOR PRODUCING PULSED LIQUID FLOW IN A DISTILLATION COLUMN

Terry E. Lund, Downers Grove, and Robert F. Millar, McCook, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Jan. 21, 1975, Ser. No. 542,872
Int. Cl.² B01F *3/04*
U.S. Cl. 261—114 R **2 Claims**



1. In combination with a fractionation tray a fractionation tray downcomer which comprises in cooperative combination:

a. a liquid-transfer conduit defining an enclosed liquid flow path, the liquid-transfer conduit having an upper portion with the shape of an inverted U located in an upper first half of the liquid-transfer conduit, the upper portion having a horizontal section which divides the liquid-transfer conduit into a shorter first leg and a longer second leg, the liquid-transfer conduit having a first opening located in the first leg and a second opening located in the second leg; and,

b. a curved, siphon-breaking vapor conduit defining an enclosed vapor flow path, the siphon-breaking conduit being joined to the upper portion of the liquid-transfer conduit and operably communicating with the liquid flow path, the siphon-breaking conduit passing downward through a first plane perpendicular to the second leg of the liquid-transfer conduit and passing through an outer surface of the horizontal section of the upper portion of the liquid-transfer conduit which is closest to said second opening in said second leg of said liquid-transfer conduit, said siphon-breaking conduit having an opening located between the first plane and a second plane perpendicular to the second leg of the liquid-transfer conduit and passing through said first opening in the first leg of said liquid-transfer conduit, whereby liquid is transferred from said fractionation tray in a periodic pulse-like manner, said periodic transfer commencing when the liquid level on said fractionation tray initiates siphonic flow through said liquid-transfer conduit, said liquid flow being terminated when the liquid level on said fractionation tray descends to said opening of said siphon-breaking conduit and vapor flow is initiated in said siphon-breaking conduit.

3,972,967
ACCELERATED CURING METHOD FOR SOLID PROPELLANTS

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 29, 1973, Ser. No. 418,319
Int. Cl.² C06B 21/00
U.S. Cl. 264—3 R 4 Claims

1. An accelerated curing method for curing solid propellant in propellant tubes for use in micromotors, said method comprising casting a difluoroamino-plasticized, electromagnetic energy curable propellant composition into thin wall-titanium tubes of predetermined size and with a graphite-epoxy overwrap; and thereafter, subjecting said thin walled-titanium tubes containing said propellant composition for a predetermined period of about 30 to about 35 minutes to electromagnetic energy with a predetermined frequency range of 30 to 30,000 MHz to effect curing of said propellant composition to yield cured grains in said tubes, said grains having a uniformity of measured Shore hardness from about 30 to about 35 throughout the propellant grains.

3,972,968
USE OF HOT BUOYANT LIQUID TO CONVERT PITCH TO CONTINUOUS CARBON FILAMENT

Edward M. Kohn, Philadelphia, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Nov. 21, 1974, Ser. No. 525,690
Int. Cl.² B01D 47/00; C01B 31/00, 31/02, 31/04
U.S. Cl. 264—29.2 28 Claims

1. A process for producing continuous carbon filaments comprising:

a. forming at least one stream of molten carbon forming pitch wherein resulting formed molten pitch is in contact with a liquid selected from a group consisting of a blend of molten inorganic salts and molten inorganic oxide;

b. passing the formed molten pitch stream generally vertically upward through the liquid which is maintained within a temperature range wherein the pitch forms a continuous stream;

c. continuing the generally vertically upward passage of the stream of formed molten pitch through a second liquid layer maintained between a temperature of about 450°–700°C and wherein the second liquid liquid layer is in direct contact with the first liquid layer and both layers are composed of the same material and upon leaving the second liquid layer the pitch's hydrogen content is substantially reduced; and

d. after the formed pitch leaves the second liquid layer it enters an inert atmosphere maintained at a temperature in excess of about 900°–1000°C and upon leaving the inert atmosphere the previously formed pitch stream is a carbon filament.

3,972,969
MANUFACTURE OF CEMENT-RESIN COMPOSITE ARTICLES

Arturo Rio; Marcello Cerrone, both of Soc. Calci e Cementi di Segni Laboratorio Centrale, 00034 Colleferro (Rome), and Alberto Saini, Via Tripoli, 143, 00199 Rome, all of Italy

Continuation-in-part of Ser. No. 166,298, July 26, 1971, abandoned. This application Aug. 24, 1973, Ser. No. 392,091
Claims priority, application Italy, Aug. 6, 1970, 52712/70; Aug. 8, 1970, 52749/70
Int. Cl.² C04B 7/02; C08H 17/00
U.S. Cl. 264—42 5 Claims

1. A process for manufacturing cement articles having very high mechanical strength, comprising:

a. forming articles of a desired shape from a member selected from the group consisting of mortar and concrete prepared from water and a member selected from the group consisting of Portland cement having a high silicic modulus, pozzolana cement and a mixture consisting of 50 to 90% by weight of Portland cement and 50 to 10% by weight of reactive siliceous material;

b. pre-aging said articles at room temperature;

c. steam-curing said articles in an autoclave at a temperature from 150° to 250°C. for 1 to 6 hours;

d. maintaining the steam-cured articles in an anhydrous environment at a temperature from 120° to 350°C. for 1 to 12 hours, thereby to produce porous articles;

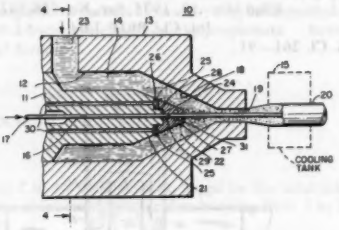
e. impregnating said articles with a liquid monomeric polymerizable substance in an amount of the order of 10–15% by weight; and

f. polymerizing said monomeric substance in situ.

3,972,970
METHOD FOR EXTRUDING CELLULAR THERMOPLASTIC PRODUCTS

John James Taylor, Northampton Township, Bucks County, Pa., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Feb. 7, 1974, Ser. No. 440,412
Int. Cl.² B29D 27/00; B29F 3/10
U.S. Cl. 264—45.9 6 Claims



1. A method of providing a layer of thermoplastic material, including at least a cellular portion, around a wire, said method comprising:

a. providing an extrusion head having an inlet opening, a longitudinal axis extending therethrough, and an outlet opening;

b. providing a core tube extending longitudinally into said extrusion head having a porous surface in at least a discrete portion of the periphery thereof between the inlet and outlet openings of said extrusion head, the core tube including a longitudinally oriented aperture extending therethrough and opening longitudinally into the interior of said extrusion head substantially centrally with respect to said porous surface;

c. forcing fluent thermoplastic material into the inlet opening of said extrusion head, through said extrusion head and along said porous surface, and out of said extrusion head through the outlet opening thereof;

d. introducing through said porous surface a gaseous expanding medium into said fluent thermoplastic material so that the expanding medium is incorporated in at least a discrete central region of the fluent thermoplastic material;

e. advancing a wire through said longitudinally oriented aperture extending through said core tube, then along a path in said extrusion head, and then out through the outlet opening thereof such that the wire passes substantially through the center of said discrete central region of the fluent thermoplastic material;

f. extruding said fluent thermoplastic material and said gaseous expanding medium located in at least said discrete central region therein from the extrusion head through the outlet opening thereof as a layer surrounding said wire; and

g. expanding said gaseous expanding medium in said fluent thermoplastic material as the fluent thermoplastic material and the wire exit together from the outlet opening of said extrusion head.

3,972,971
METHOD OF MAKING ANIMAL LITTER

Joseph L. Dantoni, 2727 Old Washington Road, Westminster, Md. 21157

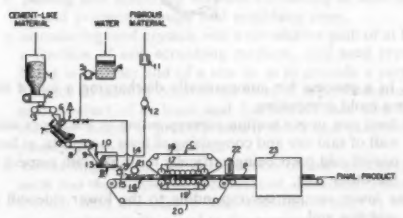
Filed Sept. 11, 1974, Ser. No. 504,870
Int. Cl.² B01J *2/20*
U.S. Cl. 264—115 **2 Claims**

1. A method of making pelleted animal litter comprising:
a. grinding peanut hulls to a particle size which will pass through a sieve of one-sixteenth to one-half inch;
b. mixing said ground hulls with a chlorophyl-containing material in an amount to give the mixture a chlorophyl content of substantially one percent;
c. heating said mixture with steam to soften and saturate said mixture with moisture into a pliable continuous state, and
d. forcing said heated mixture through appropriate dies wherein said mixture in passing through and from said dies is thereby formed into dry pellets having a density of three to six times that of loose peanut hulls.

3,972,972
PROCESS FOR PRODUCING A BOARD OF CEMENT-LIKE MATERIAL REINFORCED BY FIBROUS MATERIAL AND APPARATUS FOR THE PROCESS

Tsuyoshi Yano, Tokyo; Takao Take, Mitaka; Kentaro Nakahara, Tokyo, and Tetsuro Sasano, Chiba, all of Japan, assignors to Onoda Cement Company, Ltd., Japan

Filed Apr. 18, 1974, Ser. No. 462,176
Claims priority, application Japan, Apr. 21, 1973, 48-55594
Int. Cl.² B28B *1/52*
U.S. Cl. 264—117 **6 Claims**



1. A process for continuously producing a dense board of cement-like material reinforced by fibrous material, which comprises:
a. preparing granules of cement-like material having a diameter of 1 mm to 10 mm by adding water to a powdery, cement-like material in the minimum amount required for granulation;
b. preparing a granular mixture of the cement-like material and fibrous material by means of a pan-shaped pelletizer or a drum-type rotary system mixer by sprinkling fibrous material having a fiber length of 20 mm to 100 mm dispersed in air onto the above prepared granules of cement-like material; and
c. forming said granular mixture into a board under compression with the addition of water in such an amount that the total amount of water is the minimum amount theoretically required for hydration.

3,972,973
METHOD OF MAKING RUBBER AND POLYESTER STRUCTURES

James Frank Yardley, Lichfield, and Reginald Trevor Wragg, Tamworth, both of England, assignors to Dunlop Limited, London, England

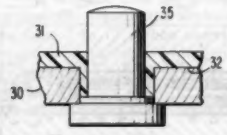
Filed Aug. 19, 1974, Ser. No. 498,427
Claims priority, application United Kingdom, Sept. 22, 1973, 44540/73; Aug. 29, 1973, 40755/73; Aug. 9, 1974, 35136/74
Int. Cl.² B29H *9/00;* **B29F** *1/00*
U.S. Cl. 264—265 **15 Claims**

1. A method of making a composite structure of:
1. a vulcanized unsaturated rubber selected from the group consisting of unsaturated hydrocarbon rubbers, polychloroprene and copolymers of chloroprene with at least one copolymerizable hydrocarbon, and
2. a thermoplastic ester-based polymer selected from the group consisting of (A) reaction products of at least one aliphatic dihydric alcohol and at least one aromatic compound having two acidic groups attached to the aromatic nucleus, one being a carbonyl-containing acidic group or an acidic hydroxyl group, and (B) elastoplastic linear block copolymers having at least one block of a reaction product defined in (A), the vulcanized unsaturated rubber being bonded directly to the ester-based polymer without an adhesive interlayer, which comprises
i. treating the surface of said vulcanized unsaturated rubber to be bonded to said thermoplastic ester-based polymer with a treatment agent solution selected from the group consisting of concentrated nitric acid, hypochlorous acid and hypochlorous acid generators,
ii. heating said thermoplastic ester-based polymer to melt at least the surface to be bonded to said vulcanized unsaturated rubber, and
iii. solidifying the molten thermoplastic ester-based polymer in contact with the treated vulcanized unsaturated rubber.

3,972,974
MANUFACTURE OF ABRASION-RESISTANT SCREENING APPARATUS

Francisco A. Pico, Donato Guerra 2210, Chihuahua, Chihuahua, Mexico

Filed Sept. 4, 1970, Ser. No. 69,813
Int. Cl.² B29D *3/02, 9/00;* **B29G** *7/00*
U.S. Cl. 264—267 **12 Claims**



1. A method of coating a perforated substrate to produce a screening member of increased abrasion resistance, said substrate having upper and lower major surfaces interconnected by side surfaces and having perforations defined by sidewalls extending between said major surfaces, said method comprising the steps of
inserting a form axially into each perforation to define a molding cavity between the form and perforation sidewall which is accessible from said upper surface;
providing means preventing overflow of said side surfaces;
pouring hardenable elastomer onto said upper surface and into each molding cavity to form a coating adhered to said upper surface and to perforation sidewall contiguous to the cavity;

hardening said elastomer; and
removing said forms.

3,972,975
METHOD OF MANUFACTURING INLAID HOLLOW PLASTIC BALL

Jiseki Noda, Kawasaki, Japan, assignor to Nodalon Co., Ltd., Tokyo, Japan

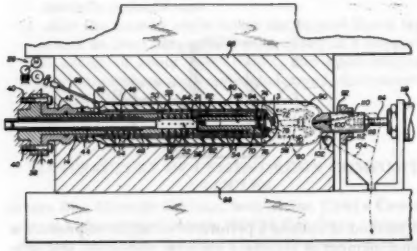
Continuation-in-part of Ser. No. 162,456, July 14, 1971, abandoned. This application Apr. 18, 1975, Ser. No. 569,175
Int. Cl.[2] B29B *5/04, 5/12;* B29D *3/00*
U.S. Cl. 264—275 **3 Claims**

1. In a method of manufacturing an inlaid hollow plastic ball in which a piece of a preformed polyvinyl chloride decorative film is fixed on an inner surface of a metal mold by means of a transparent adhesive, and a polyvinyl chloride resin is poured into said metal mold so as to form a body of a hollow plastic ball, and said mold is clamped and rotated laterally and lengthwise while heating to effect gelation of said resin along said inner surface, and then the resulting ball is removed from said mold, the improvement which comprises using as an adhesive a mixture of polyvinyl chloride resin paste and a 10% (wt.) solution of vinyl acetate resin in trichloroethylene, said paste and said solution being in the ratio of 1:0.2 to 0.6 (by weight).

3,972,976
METHOD FOR LONGITUDINAL STRETCH OF A PARISON TO BE BLOW MOLDED

John J. Farrell, Green Brook, N.J., assignor to Farrell Patent Company, Greenbrook, N.J.

Division of Ser. No. 441,811, Feb. 12, 1974, Pat. No. 3,905,738. This application Jan. 31, 1975, Ser. No. 545,934
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—314 **8 Claims**



1. A method of orienting a parison on a core rod for subsequent blow molding to form a hollow oriented article which comprises, conditioning the parison to its orientation temperature, introducing a temperature conditioning fluid between the core rod and the inside of the parison for maintaining the parison at its orientation temperature while stretching the parison lengthwise of the core rod, and maintaining a fluid cushion on the outside of the parison to restrain any substantial circumferential stretching of the parison by said fluid inside the parison during said lengthwise stretching.

3,972,977
MOULDING PROCESS FOR UNSATURATED POLYESTER RESINS CONTAINING FILLER MATERIAL

David Philip Fry, Llanishen, Wales, assignor to BP Chemicals International Limited, England

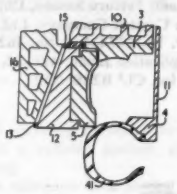
Filed Apr. 5, 1972, Ser. No. 241,375
Claims priority, application United Kingdom, Apr. 6, 1971, 8885/71; Oct. 25, 1971, 49425/71; Feb. 2, 1972, 4886/72
Int. Cl.[2] B29G *1/00, 7/00*
U.S. Cl. 264—331 **17 Claims**

1. In a process for the preparation of a moulded article by subjecting a moulding composition to the action of heat and pressure in a matched metal mould having a flash channel, the improvement which consists of the use as the moulding composition of a material comprising an unsaturated polyester, an ethylenically unsaturated monomer copolymerisable therewith, a fibrous reinforcing filler and a primary particulate inorganic filler of particle diameter greater than the width of the flash channel of the mould, said primary particulate inorganic filler being present in an amount greater than 6.0% by weight of the total moulding composition and sufficient to improve the surface finish of the moulded article.

3,972,978
PROCESS FOR AUTOMATICALLY DISCHARGING A TIRE FROM THE CURING MOLD

Renato Caretta, Cedrate di Gallarate (Varese), Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Division of Ser. No. 307,953, Nov. 20, 1972, abandoned. This application Dec. 16, 1974, Ser. No. 533,218
Claims priority, application Italy, Nov. 26, 1971, 31638/71
Int. Cl.[2] B29C *7/00;* B29H *5/02*
U.S. Cl. 264—334 **2 Claims**



1. In a process for automatically discharging a cured tire from a mold comprising
at least one upper section corresponding to the upper sidewall of said tire and comprising at least two parts, at least one of said parts being vertically movable with respect to the other part,
one lower section corresponding to the lower sidewall of said tire and
one intermediate section comprising a plurality of sectors radially displaceable in both directions and corresponding to the tread band of said tire, wherein
the lower section of the cured tire is disengaged from the lower section of said mold by raising the upper and intermediate sections, with which the tire is still engaged,
the tread band of the cured tire is disengaged from the intermediate section by radially outwardly displacing said sectors,
the upper sidewall of the tire is disengaged from at least a part of the upper section of the mold by pushing the cured tire downward with respect to the latter and to said intermediate section by moving the other part of said upper section, still engaged to the corresponding part of the upper sidewall of said cured tire, the improvement which comprises
pushing the cured tire downward to a level lower than that corresponding to the lower surface of the sectors of said intermediate section,

displacing radially inwardly said sectors to impart an inner diameter smaller than the outer diameter of the tire to said intermediate section, and

raising the cured tire again together with said engaged part of said upper section whereby said tire is also disengaged from the latter part when said tire comes into contact with the lower surface of the sectors and stops, while said part continues to rise towards the other part of the upper section of the mold.

3,972,979

METHOD OF DECOMPOSING HALOHYDROCARBONS

Yoichi Kageyama, Yokohama, Japan, assignor to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed May 14, 1974, Ser. No. 469,804

Claims priority, application Japan, May 14, 1973, 48-53292; May 29, 1973, 48-60107

Int. Cl.² B01D *53/34*

U.S. Cl. 423—240 4 Claims

1. A method of oxidatively decomposing a chlorohydrocarbon having from 1 to 10 carbon atoms to carbon dioxide, water, hydrogen chloride and free chlorine which comprises contacting an exhaust gas containing from 10 – 50,000 ppm of said chlorohydrocarbon and molecular oxygen with a catalytic amount of boehmite-supported platinum catalyst at a temperature of from 200° – 500°C.

3,972,980

PROCESS REMOVING SULFUR DIOXIDE FROM GASES

Philip S. Lowell, Austin, Tex., assignor to Radian Corporation, Austin, Tex.

Filed July 31, 1974, Ser. No. 493,340

Int. Cl.² C01B *17/00*

U.S. Cl. 423—242 17 Claims

1. A process for the removal of sulfur dioxide from gas streams comprising:

a. passing said gas stream through a gas-liquid scrubbing zone containing a scrubbing medium comprising a reactant which reacts with said sulfur dioxide to form a product selected from the class consisting of sulfites, sulfates and mixtures thereof,

b. passing said scrubbing medium containing at least some of said product through said scrubbing zone,

c. introducing seed crystals into a circulation path of at least a fraction of said scrubbing medium, said seed crystals being in number and of a size so as to provide a particle balance to thereby control the level of supersaturation of said product of at least said fraction of said scrubbing medium below a predetermined level and control the particle size of said product,

d. controlling the rate of introduction of said seed crystals such that the number of seed crystals, including randomly formed seed crystals, in said circulation path is maintained substantially equal to the number of product crystals removed from said circulation path, and

e. controlling the composition of said scrubbing medium.

3,972,981

METHOD OF PREVENTING GYPSUM SCALE FORMATION IN PHOSPHORIC ACID PLANT FILTERS

Douglas Charles Harper, Ipswich; Norman Robinson, Felixstowe, and Stanislaw Maria Janikowski, Grimsby, all of England, assignors to Fisons Limited, London, England

Filed Oct. 25, 1973, Ser. No. 409,366

Claims priority, application United Kingdom, Nov. 8, 1972, 51454/72

Int. Cl.² C01B *25/16*

U.S. Cl. 423—320 4 Claims

1. In a process for producing phosphoric acid by the wet process in which a slurry of calcium sulphate hemihydrate crystals in phosphoric acid is produced, which slurry is then filered on a rotating pan type vacuum filter and then washed with a liquor in a number of stages, the improvement which comprises incorporating an additive selected from condensed phosphates having an $M_2O:P_2O_5$ molar ratio of from 1:1 to 1.5:1 in which M is hydrogen or an alkali-metal into the slurry before filtration or into the liquor between the point at which it is separated from the crystals and at the point at which it is re-applied to the crystals.

3,972,982

PROCESS FOR REMOVING FLUORINE COMPOUNDS FROM PHOSPHORIC ACID

Louis F. Centofanti, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 3, 1975, Ser. No. 554,810

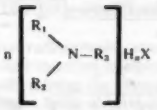
Int. Cl.² C01B *25/16*

U.S. Cl. 423—321 S 4 Claims

1. A process for removing fluorine compounds from aqueous phosphoric acid containing the same, said process comprising (1) contacting said phosphoric acid with a water insoluble extractant comprising a mixture, dissolved in an organic diluent, of a silane represented by the formula

wherein from one to two of R_I, R_{II}, R_{III} and R_{IV} are selected from the group consisting of —OH, —Cl, and —OR, R being an alkyl group containing from 1 to 4 carbon atoms and the remaining R_I, R_{II}, R_{III} and R_{IV} are selected from the group consisting of alkyl, phenyl, and alkyl phenyl, said remaining R_I, R_{II}, R_{III} and R_{IV} containing a total of from 12 to 25 carbon atoms; and an amine compound selected from the group consisting of: a. long-chain hydrocarbyl amines represented by the formula

R_1 and R_2 each being selected from the group consisting of saturated and ethylenically unsaturated aliphatic hydrocarbyl groups containing from 7 to 15 carbon atoms and R_3 being selected from the group consisting of hydrogen and saturated and ethylenically unsaturated aliphatic hydrocarbyl groups containing from 1 to 18 carbon atoms; b. salts of said long-chain hydrocarbyl amines represented by the formula



n being an integer from 1 to 3 and X being an anion of a mineral acid having a K greater than 8×10^{-3}; the weight ratio of said silane to said amine being from 20 to 1 to 1 to 20 and said extractant being used in sufficient amount to extract fluorine compounds from said phosphoric acid and to form a water-immiscible extractant phase, (2) separating said extractant containing extracted fluorine compounds from said phosphoric acid and (3) further contacting the separated extractant with an aqueous basic solution and removing fluorine compounds from said extractant.

3,972,983
CRYSTALLINE ZEOLITE ZSM-20 AND METHOD OF PREPARING SAME

Julius Ciric, Pitman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 25, 1974, Ser. No. 526,883
Int. Cl.² C01B *33/28*
U.S. Cl. 423—328 **11 Claims**

1. A synthetic crystalline aluminosilicate zeolite having a composition expressed in terms of mole ratios of oxides in the anhydrous state as follows:

$$(0.3\text{–}0.6)R_2O;\ (0.4\text{–}0.7)M_2O:\ Al_2O_3:\ (x)SiO_2$$

wherein R is a tetraethylammonium cation, M is an alkali metal cation and x is at least 7, and having an X-ray powder diffraction pattern which shows the significant lines set forth in Table 1 of the specification.

3,972,984
PROCESS FOR THE PREPARATION OF CARBON FIBER

Masaya Iizuka; Nobu Sugiyama, and Yukuo Hisatomi, all of Yokohama, Japan, assignors to Nippon Carbon Co. Ltd., Tokyo, Japan

Filed Feb. 26, 1975, Ser. No. 553,188
Claims priority, application Japan, Dec. 13, 1974, 49-142595
Int. Cl.² C01B *31/07*
U.S. Cl. 423—447.6 **6 Claims**

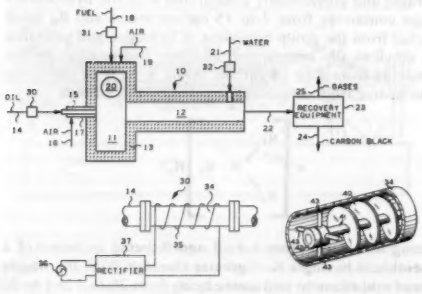
1. A process for the preparation of carbon fibers having improved strength and surface activity, comprising the steps of:

heating polyacrylonitrile fibers under tension in an oxidizing atmosphere to produce oxidized fibers, and further heating the thus obtained oxidized fibers in an atmosphere containing from 0.2 to less than 10% by volume of gaseous hydrogen chloride, from 0.5 to 6% by volume of moisture and the remainder an inert gas, to carbonize said oxidized fibers thereby producing said carbon fibers.

3,972,985
REDUCTION OF DEPOSITS IN CARBON BLACK REACTORS

Amaury Sanclemente, Cali (Valle), Colombia, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 16, 1974, Ser. No. 533,449
Int. Cl.² C01B *31/02*; C09C *1/48, 1/50*
U.S. Cl. 423—450 **6 Claims**



1. In a process for producing carbon black by introducing a feed oil into a reactor and therein heating the oil to an elevated temperature to decompose the oil to produce carbon black, the method of reducing deposits in the reactor wherein the feed oil contains at least one metal of the group consisting of silicon, aluminum, iron, sodium and calcium, which comprises establishing a magnetic field of at least 10 oersteds, passing the feed oil through the magnetic field before introducing the feed oil into the reactor, and imparting a swirl to the feed oil while in the magnetic field.

3,972,986
PRODUCTION OF HIGH STRUCTURE SOFT CARBON BLACK

Glenn J. Forseth, Toledo, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 4, 1973, Ser. No. 366,526
Int. Cl.² C09C *1/50*; C01B *31/02*
U.S. Cl. 423—456 **2 Claims**

1. A method of producing a high structure soft carbon black which comprises:

a. introducing a liquid hydrocarbon feed into a first zone of a tubular reactor;

b. tangentially introducing hot combustion gases being produced by the oxidation of a gaseous fuel with air employing an air to fuel volume ratio or about 16 to 1 inch into said first zone,

c. forming a mixture of said liquid hydrocarbon feed and said hot combustion gases in said first zone to bring said hydrocarbon feed to its pyrolytic decomposition temperature, employing an air total to liquid hydrocarbon feed ratio of about 340 to about 360 SCF per gallon,

d. passing said mixture through said first zone at a first velocity while increasing the temperature of said liquid hydrocarbon feed to its pyrolytic decomposition temperature,

e. upon attainment of the hydrocarbon feed of its pyrolytic decomposition temperature passing said mixture into a second zone while continuing the pyrolytic decomposition of said liquid hydrocarbon feed,

f. passing said mixture through said second zone at a second velocity of about 20 to about 30 feet/second to form carbon black, said first velocity being about 2.5 to about 3 times the second velocity, and

g. recovering said carbon black.

3,972,987

PROCESS FOR REGENERATING SULFURIC ACID

Helmold von Plessen, Kelkheim, Taunus, and Siegfried Schiessler, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 4, 1974, Ser. No. 529,520

Claims priority, application Germany, Dec. 6, 1973, 2360706

Int. Cl.² C01B *17/90*; B01D *3/34*

U.S. Cl. 423—523 21 Claims

17. A process for regenerating contaminated aqueous 70 to 90% by weight sulfuric acid containing up to 2% by weight organic impurities, based on carbon content, selected from the group consisting of aromatic mono- and polycarboxylic acids, organic nitrogen compounds and salts of light and/or heavy metal ions and ammonium ions, which comprises adding about 1 to 5% by weight nitric acid to the contaminated sulfuric acid, distilling the contaminated acid in a distillation apparatus, at a pressure of 5 to 12 torrs and at a temperature of up to 200°C, condensing the distillation vapors which contain water and sulfuric acid, withdrawing nonvolatile distillation bottoms products, feeding the distillation condensate to the dephlegmator portion of a Pauling apparatus, which apparatus comprises a vessel portion containing 96 to 97% by weight boiling sulfuric acid, stripping water from the condensate and concentrating the condensate sulfuric acid in the vessel portion up to 96 to 97% sulfuric acid.

3,972,988

SULFUR PRODUCTION

Peter Urban, Northbrook, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 5, 1975, Ser. No. 574,221

Int. Cl.² C01B *17/02*

U.S. Cl. 423—571 12 Claims

1. In a process for the preparation of sulfur by contacting an aqueous ammonium sulfide solution with an oxygen-containing gas in the presence of a metal phthalocyanine catalyst at polysulfide-forming conditions to produce sulfur and a polysulfide effluent, the improvement which comprises the steps of

a. decomposing at least a portion of said polysulfide effluent with steam at a temperature of from about 115° to about 125°C. and a pressure of about 10 psig. to about 20 psig. to produce a vaporous effluent comprising water, hydrogen sulfide and ammonia;

b. contacting at least a portion of said vaporous effluent with an oxygen-containing gas in the presence of a metal phthalocyanine catalyst dispersed on a solid support, said metal phthalocyanine catalyst being in contact with a liquid phase comprising a thiosulfate-containing compound, at a temperature of from about 115° to about 125°C. and a pressure of from about 10 psig. to about 20 psig. to produce steam, sulfur and a thiosulfate compound; and

c. recovering the resultant sulfur.

3,972,989

REDUCING THE CONSUMPTION OF ANTHRAQUINONE DISULFONATE IN STRETFORD SOLUTIONS

Donald M. Fenton, Anaheim, and Raoul P. Vaell, Los Angeles, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Aug. 14, 1974, Ser. No. 497,322

Int. Cl.² C01B *17/04*

U.S. Cl. 423—573 G 10 Claims

1. In a process for treating a hydrogen sulfide-containing feed gas to convert the hydrogen sulfide to elemental sulfur in which said feed gas is contacted with an alkaline aqueous solution containing a water-soluble metal vanadate and a water-soluble anthraquinone disulfonate to yield an effluent gas of reduced sulfur content, the solution is thereafter regenerated by contact with an oxygen-containing gas, elemental sulfur is recovered from said solution, and said regenerated solution is recycled to said feed gas contacting step, and wherein said anthraquinone disulfonate is being consumed by oxidation, the improvement which comprises the additional step of adding a thiosulfate ion precursor to said solution to increase the concentration of thiosulfate ion in said solution, said thiosulfate ion precursor being selected from the group consisting of the ammonium, alkali metal, and alkaline earth metal salts of thiosulfate, sulfite, bisulfite, pyrosulfite and hydrosulfite.

3,972,990

METHOD OF PREPARING LOW DENSITY-HIGH MICROPORE VOLUME REFRACTORY INORGANIC OXIDE PARTICLES

Kenneth D. Vesely, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 30, 1975, Ser. No. 582,525

Int. Cl.² C01F *7/02*

U.S. Cl. 423—628 10 Claims

1. A method of preparing spherical particles of alumina having an average bulk density of from about 0.1 to about 0.6 grams per cubic centimeter, with from about 0.7 to about 5.0 cubic centimeters per gram of the total pore volume being associated with pores having an average diameter of less than about 600 Angstroms, said method comprising the steps of:

a. effecting the gelation of a hydrosol of said alumina in admixture with ammonia in a hot oil bath to form hydrogel spheres;

b. percolating a water-miscible alcohol through said hydrogel spheres at a temperature of from about 20° to about 50° C. until the effluent alcohol is substantially free of acquired water;

c. thereafter evaporating the resulting wateralcohol solution from the hydrogel spheres at a pressure of from about 300 to about 600 millimeters of mercury and at a temperature substantially equivalent to the boiling point of said alcohol-water solution at said pressure;

d. further drying said spheres in a substantially water-free atmosphere to produce spheres characterized by less than about 10 wt. % loss on ignition at 900° C.; and

e. calcining the dried spheres at a temperature of from about 425° to about 750° C. in a substantially water-free atmosphere.

3,972,991

RADIOISOTOPIC ASSAY AND BINDER THEREFOR

Jesse Douglas Caston, Cleveland Heights, Ohio, and Barton A. Kamen, Rockville Centre, N.Y., assignors to Case Western Reserve University, Cleveland, Ohio

Filed Mar. 18, 1974, Ser. No. 451,875

Int. Cl.² G21H *5/02*; G01T *1/16*; A61K *43/00*

U.S. Cl. 424—1.5 16 Claims

1. A competitive radioisotopic assay for measuring the concentraion of folate in serum comprising the steps of:

a. radioisotopically relating the bound amounts of a labeled folate and a known folate at various concentrations of the known folate in a first system containing a predetermined amount of the labeled folate, a predetermined amount of a binder factor for the folates, and a predetermined amount of defolated test serum;

b. radioisotopically determining the bound amount of said labeled folate in a second system containing said predetermined amount of labeled folate, the test serum, and said predetermined amount of said binder factor; and

c. correlating the bound amount of labeled folate determined in step (b) through the relationship determined in step (a) to ascertian the amount of folate in the serum.

3,972,992

DIAGNOSTIC TEST FOR OPIUM ALKALOIDS

Roy Cleeland, Jr., Short Hills, N.J., and Hans Jacob Hager, New York City, N.Y., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 374,849, June 29, 1973, Pat. No. 3,888,864. This application Feb. 28, 1975, Ser. No. 553,942

Int. Cl.[2] A61K *31/74, 31/485;* G01N *31/00, 33/16*

U.S. Cl. 424—12 8 Claims

1. An immunological diagnostic reagent comprising discrete particles of latex polymer having carboxyl groups covalently bound through an amide linkage to the amino group of an amino lower alkyl ether of the phenolic hydroxyl group of an opium alkaloid.

5. A method of detecting the presence of opium alkaloids in body fluid which comprises observing the inhibition of agglutination caused by said body fluid as compared with a known opium alkaloid free body fluid when said first body fluid is incubated with antiserum against opium alkaloids, and then with a reagent comprising discrete particles of latex polymer having carboxyl groups covalently bonded through an amide linkage to the amino group of an amino lower alkyl ether of the phenolic hydroxyl group of an opium alkaloid.

3,972,993

INSECTICIDAL DEVICE

Hidetoshi Kobayashi; Yoshiaki Niitani, and Hilomithu Abiru, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 7, 1974, Ser. No. 521,919

Claims priority, application Japan, Nov. 13, 1973, 48-126769

Int. Cl.[2] A01N *9/00;* A01M *1/00*

U.S. Cl. 424—15 1 Claim

1. In an insecticide and insect attractant carrier structure positioning each independently and thereby stabilizing the residual effectiveness of insecticides adversely affected by the presence of insect attractants, the improvement comprising a base sheet affixed to at least one perforated sheet, having a number of perforations, and having about 25–70 percent perforated area, each perforation having sufficient width to accomodate insects attracted to effective insect attractant adhered, impregnated, or coated, without insecticide, to said base sheet, with effective contact insecticide adhered, impregnated, or coated, without insect attractant, to said perforated sheet, said insecticide, thereby independently positioned from said insect attractant, being stabilized against and free from decomposition, instability, loss of residual effectiveness and other adverse effects attributable to contact with insect attractant.

3,972,994

DISUBSTITUTED AZABICYCLOALKANES

Laszlo Beregi, Boulogne, Seine; Pierre Hugon, Rueil-Malmaison; Xavier Pascaud, Paris, and Jean-Claude Poignant, Bures, Yvette, all of France, assignors to Science Union et Cie, Neuilly-sur-Seine, France

Filed Nov. 20, 1974, Ser. No. 525,623

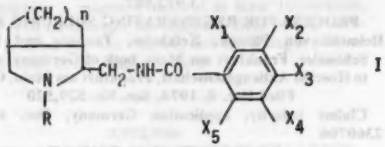
Claims priority, application United Kingdom, Dec. 14, 1973, 58034/73

Int. Cl.[2] C07D *209/44;* A61K *31/40*

U.S. Cl. 424—274 15 Claims

1. A compound selected from the group consisting of:

A. Disubstituted azabicycloalkanes of the general formula I:



wherein:

n is 2;

R is selected from the group consisting of saturated and unsaturated aliphatic hydrocarbon having from 1 to 5 carbon atoms inclusive in straight and branched chain, and,

X_1, X_2, X_3, X_4 and X_5 are each selected from the group consisting of hydrogen, halogen, hydroxy, alkyl and alkoxy each having from 1 to 5 carbon atoms inclusive, trifluoromethyl, nitro, amino, and sulfamoyl, and,

B. Physiologically tolerable acid addition salts thereof.

3,972,995

DOSAGE FORM

Andrew G. Tsuk, Plattsburgh, and Frederick H. Martin, West Chazy, both of N.Y., assignors to American Home Products Corporation, New York, N.Y.

Filed Apr. 14, 1975, Ser. No. 567,788

Int. Cl.[2] A61F *7/02;* A61L *15/03;* A61M *35/00*

U.S. Cl. 424—28 2 Claims

1. A buccal dosage form for buccal administration of a buccally effective medicament comprising:

a. a preshaped, planar, water-insoluble support member comprised of an inert flexible film;

b. a concave recess defined in a portion of one surface of said support member further defining a planar margin of the support member surface surrounding the concave recess,

c. a moisture-activated adhesive precurser comprised of a hydrocolloid admixed with polyvinylpyrrolidone applied to at least the planar margin of the support member surface surrounding the concave recess.

d. a medicament effective buccally supported in said concave recess, the top surface of said medicament being below or coplanar with the margin of said support member surface surrounding the concave recess.

3,972,996

DEODORANT COMPOSITIONS CONTAINING TRANS-1,4-DIPHENYL-2-BUTENE-1,4-DIONE

Robert G. Pitts, and Bruce T. Welsh, both of Morris Plains, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed June 9, 1975, Ser. No. 585,112

Int. Cl.[2] A61K *7/16, 7/32;* A61L *9/01;* A61K *9/68*

U.S. Cl. 424—48 20 Claims

1. A non-toxic deodorant composition suitable for use in the oral cavity comprising trans-1,4-diphenyl-2-butene-1,4-dione and a non-toxic, non-reactive carrier therefor, said trans-1,4-diphenyl-2-butene-1,4-dione being present in an amount effective to initiate the onset of substantial deodorization of odoriferous, volatile sulfur compounds containing mercaptans and hydrogen sulfide within approximately 15 minutes, said

trans-1,4-diphenyl-2-butene-1,4-dione being present in an amount of from about 0.01% to about 0.1% by weight, based on the weight of the total composition.

3,972,997

NOVEL COSMETICS CONTAINING PULLULAN

Seizo Nakashio, Nishinomiya; Kozo Tsuji; Nobuhiro Toyota, both of Osaka, and Fumio Fujita, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Hayashibara Biochemical Laboratories, Incorporated, Okayama, both of Japan

Filed Oct. 3, 1974, Ser. No. 511,524

Claims priority, application Japan, Oct. 16, 1973, 48-116652

Int. Cl.² A61K *7/16*

U.S. Cl. 424—49 **2 Claims**

1. A cosmetic containing pullulan having a molecular weight of 5,000 to 5,000,000 as an ingredient of cosmetic lotions, cosmetic powders, rouges, cosmetics for use around the eyes, facial packs, shampoos, set lotions, hari lacquers and tooth paste, the content of said pullulan being 0.01 to 99 parts by weight per 100 parts by weight of the total cosmetic.

3,972,998

HAIR PREPARATION CONTAINING A FLUOROPOLYMER

John Anthony Keiner, London, England, assignor to Lever Brothers Company, New York, N.Y.

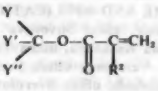
Continuation of Ser. No. 174,214, Aug. 23, 1971, abandoned, which is a continuation of Ser. No. 79,628, Oct. 9, 1970, abandoned. This application Nov. 15, 1974, Ser. No. 524,004

Claims priority, application United Kingdom, Oct. 24, 1969, 52301/69

Int. Cl.² A61K *7/06*

U.S. Cl. 424—70 **8 Claims**

1. A method for reducing the time required for drying hair on the head, which comprises applying thereto an effective amount of hair cosmetic preparation containing from about 0.001 to about 6% by weight of a vinyl polymer of a fluorine-containing monomer of the formula:



where Y is selected from the group consisting of a partially and wholly fluorinated C_1–C_{11} alkyl group and Y′ and Y″ individually are selected from the group consisting of partially and wholly fluorinated C_1–C_{11} alkyl groups and hydrogen and R^2 is selected from the group consisting of hydrogen and methyl and a cosmetically acceptable carrier thereof.

3,972,999

GRISEOFULVIN DOSAGE FORMS

Andrew G. Tsuk, Plattsburg, N.Y., assignor to American Home Products Corporation (Del.), New York, N.Y.

Filed June 25, 1975, Ser. No. 590,345

Int. Cl.² A61K *31/74, 31/34*

U.S. Cl. 424—78 **4 Claims**

1. A solid glassy miscible melt mix comprising about 30 to 60% by weight of the mix of amorphous griseofulvin and a polyglycolide or lactic acid modified polyglycolide, the polyglycolide having a molecular weight of about 800 to about 2000 and a glycolic acid content of about 60 to 100 mole per cent.

4. A process for preparing a solid glassy melt mix containing amorphous griseofulvin which comprises,

a. reacting at a temperature of 180° to 200°C. glycolic acid in the presence of water with about 0 to 40 mole per cent, based on the glycolic acid, of lactic acid until substantially all of the water has been removed to form a polyglycolide, and

b. admixing with the polyglycolide crystalline griseofulvin at a temperature of about 230° to 240°C in an amount sufficient to provide about 30 to 60% by weight of the glassy melt mix.

3,973,000

PROCESS FOR PURIFIED RABIES VACCINE

John F. Lavender, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 223,755, Feb. 4, 1972, abandoned. This application July 18, 1975, Ser. No. 597,054

Int. Cl.² A61K *39/28*

U.S. Cl. 424—89 **3 Claims**

1. A method of purifying an egg-embryo-derived crude rabies vaccine which consists of:

A. separating the crude vaccine into liquid and solid phases by centrifuging the crude vaccine at from about 30,000 to about 80,000 G. for from about 15 to about 45 minutes;

B. collecting and dispersing the solid phase in a physiologically-acceptable vaccine diluent to produce a suspension;

C. separating the suspension into liquid and solid phases by centrifuging the suspension at from about 500 to about 2,500 G. for from about 2 to about 10 minutes; and

D. collecting the liquid phase.

3,973,001

TISSUE CELL STIMULATING BLOOD EXTRACTS

Karl-Heinz Jaeger, Freiburg, and Hellmut Mittenzwei, Munich, both of Germany, assignors to Solco Basel AG, Birsfelden, Switzerland

Continuation of Ser. No. 828,440, May 22, 1969, abandoned, which is a continuation of Ser. No. 349,785, Feb. 12, 1964, abandoned, which is a continuation-in-part of Ser. Nos. 503,344, April 22, 1955, abandoned, and Ser. No. 627,242, Dec. 10, 1956, abandoned. This application Jan. 22, 1975, Ser. No. 542,910

Claims priority, application Germany, Apr. 27, 1954, 1017744

Int. Cl.² A61K *35/14, 37/00*

U.S. Cl. 424—101 **8 Claims**

1. A process for the preparation of a tissue cell respiration stimulating blood extract which comprises (1) recovering the fresh blood of a calf, (2) defibrinating the said blood, (3) hemolyzing the defibrinated blood by stirring the latter with distilled water until hemolysis is complete, (4) removing the solids from the hemolyzed solution, (5) subjecting the resulting solution to dialysis with a cellophane membrane against an aqueous solution selected from the group consisting of distilled water and aqueous ethanol until substantially no nitrogen migrates to the dialysate, then concentrating and adjusting the pH of the outer dialysate to about 7.0 and (6) concentrating the said dialysate to a concentration of about 10 to 60 mg of dry components per ml of solution, and removing any inactive precipitate.

5. The product produced by the process of claim 1.

3,973,002

ANTIHEMOPHILIC FACTOR

James J. Hagan, Holmdel, and Charles Glaser, Raritan, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 460,417, April 12, 1974, abandoned. This application May 1, 1975, Ser. No. 573,684

Int. Cl.² A61K *35/14;* **C07G** *7/026*

U.S. Cl. 424—101 **10 Claims**

1. In a method for isolating antihemophilic factor of human blood plasma, the improvement comprising adjusting the pH of a solution of buffer-extracted plasma cryoprecipitate to from about 6.0 to about 7.0, and cooling the solution at a temperature of from about 2°C to about 20°C for from about 15 to about 60 minutes to cause precipitation of impurities.

3,973,003

PROCESS FOR THE PRESERVATION OF RAM SEMEN BY FREEZING

Guy Colas, Tours, France, assignor to Institut National de la Recherche Agronomique, Paris, France

Filed Dec. 16, 1974, Ser. No. 533,382
Claims priority, application France, Dec. 18, 1973, 73.45351
Int. Cl.² A61K *35/52;* C12K *9/00*
U.S. Cl. 424—105 15 Claims

1. In a process for the preparation of ram semen consisting in diluting the freshly collected semen in a diluent without glycerol and then in a diluent with glycerol and in subsequent freezing of the diluted semen, the improvement comprising the steps of:

a. diluting the freshly collected semen in a glycerol-free first diluent containing lactose and egg yolk,
b. cooling the mixture obtained in step (a) to a temperature less than about 5°C,
c. diluting the mixture obtained in step (b) in a second diluent containing glycerol, powdered milk and sodium citrate, the amount of glycerol being such that the final glycerol concentration of the diluted semen is at most about 4%,
d. conditioning in straws the so diluted semen and freezing.

3,973,004

METHOD OF PRODUCING FOLLICLE-STIMULATING HORMONE

Alexandr Semenovich Volynsky, ulitsa Gogolya, 75; Mikhail Ivanovich Prokofiev, ulitsa Khodzhaeva, 2, and Aida Pavlovna Kryachkova, ulitsa Ustobaeva, 43, all of Tashkent, U.S.S.R.

Filed Dec. 7, 1972, Ser. No. 312,866
Claims priority, application U.S.S.R., Dec. 7, 1971, 1721918
Int. Cl.² A61K *35/46*
U.S. Cl. 424—108 8 Claims

1. A method of producing follicle-stimulating hormone from sheep pituitary glands comprising:

A. disintegrating said pituitary;
B. extracting said hormone from said pituitary by mixing the disintegrated pituitary with about 0.2 molar ammonium sufate, adjusting the pH to 5.5 to thereby form a precipitate and a supernatant, and separating said precipitate from said supernatant;
C. purifying said hormone by:
1. adding dry ammonium sulfate to said supernatant to a concentration of 40–50 percent,
2. adjusting the pH to 7.4–7.5 to form a precipitate and a supernatant,
3. adding dry ammonium sulfate to said supernatant from step (C)(2) to a concentration of 70–80 percent to form a precipitate and a supernatant,
4. washing said precipitate from step (C)(3) with a solution of ammonium sulfate having a concentration in the range of 56–58 percent to form a filtrate,
5. adding dry ammonium sulfate to said filtrate to a concentration of 70–80 percent, and
6. adjusting the pH to 4.5 to thereby precipitate said hormone from said filtrate; and
D. separating said hormone from said filtrate.

3,973,005

ANTIBIOTIC TA

Eugene Rosenberg, 9 Habrosh St., Ra'anana, Israel

Filed July 5, 1974, Ser. No. 485,935
Claims priority, application Israel, July 10, 1973, 42701
Int. Cl.² A61K *35/74*
U.S. Cl. 424—115 4 Claims

1. A process for producing antibiotic TA, comprising:
cultivating under aerobic conditions *Myxococcus xanthus* TA ATCC 31046 or *Myxococcus xanthus* FB ATCC 25232 in a suitable culture medium until substantial antibiotic activity is obtained, and
recovering the antibiotic from said medium.

3,973,006

PEPTIDE ENZYME INHIBITORS OF ANGIOTENSIN I

Miguel Angel Ondetti, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 21, 1975, Ser. No. 551,888
Int. Cl.² A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 6 Claims

1. A peptide having the formula

Pyr-Trp-Pro-Arg-Pro-Gln-Ile-Pro-Pro-OR

or

Pyr-Trp-Pro-Arg-Pro-Gln-Ile-Pro-Pro-NH_2

wherein R is an alkyl group containing 1 to 10 carbons.

5. A method for treating hypertension in mammalian species, which comprises administering a therapeutic amount of a peptide as defined in claim 1.

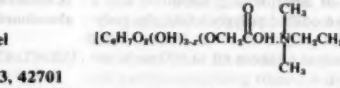
3,973,007

HIGH-MOLECULAR DERIVATIVE OF 2-DIMETHYLAMINOETHYL ESTER OF p-BUTYLAMINOBENZOIC ACID, METHOD FOR PREPARING SAME AND APPLICATION THEREOF

Milda Yanovna Pormale, ulitsa Suvorova 104, kv. 10; Nadezhda Alexandrovna Kashkina, ulitsa Talsu 9/11, kv. 22; Elfrida Indrikovna Veinberg, ulitsa Sverdlova 8, kv. 3.; Arvid Yanovich Kalninsh, ulitsa Sverdlova 8, kv. 3; Janis Shusters, ulitsa Kveles 15, korpus 4, kv. 30; Valdis Danielovich Mikazhans, ulitsa Marupes, 17, kv. 35; Indulis Valdovich Purvinsh, ulitsa Marupes, 17, kv. 86a, all of Riga, and Antons Petrovich Skutelis, Tuberkuleznaya bolnitsa "Julga", korpus 1, kv. 7, Rizhsky raion, Stopinsky S/S, all of U.S.S.R.

Division of Ser. No. 360,479, May 15, 1975, Pat. No. 3,925,356. This application June 2, 1975, Ser. No. 583,096
Int. Cl.² A61K *31/70*
U.S. Cl. 424—180 1 Claim

1. A medicinal preparation of local anesthetic action containing as the active ingredient, the high-molecular weight derivative of the 2-dimethylaminoethyl ester of p-butylaminobenzoic acid having the formula



where x is the degree of substitution from 0.6 to 1.5 and n is the degree of polymerization from 30 to 120, in combination with distilled water in a concentration of 0.16–4.48 per cent by weight.

3,973,008

KONJAC MANNAN

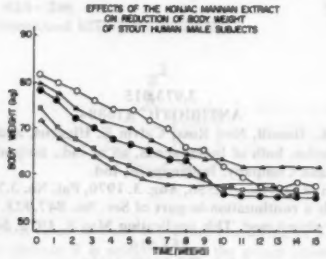
Noboru Sugiyama, Tokyo, and Hideo Shimahara, Mihara, both of Japan, assignors to Kabushiki Kaisha Shimizu Manzo Shoten, Japan

Continuation-in-part of Ser. No. 179,201, Sept. 9, 1971, Pat. No. 3,856,945. This application Oct. 9, 1974, Ser. No. 513,403

Claims priority, application Japan, Dec. 30, 1970, 45-128288

Int. Cl.² A61K *35/78, 31/70*

U.S. Cl. 424—195 3 Claims



1. A method for reducing body weight in overweight Japanese humans fed with the general Japanese diet which comprises orally administering a therapeutically effective dose of purified, water-soluble konjac mannan in the range of about 0.1 – 10 g. per kg of body weight per day.

3,973,009

INSECTICIDAL AND MITICIDAL METHOD

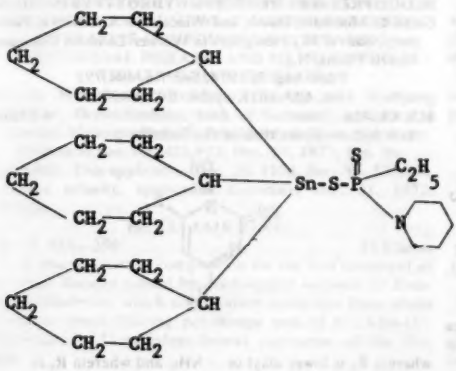
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 466,930, May 6, 1974, Pat. No. 3,917,827, which is a division of Ser. No. 304,871, Oct. 19, 1972, Pat. No. 3,832,370. This application July 30, 1975, Ser. No. 600,335

Int. Cl.² A01N *9/36*

U.S. Cl. 424—200 2 Claims

1. The method which comprises the step of killing insects and mites by contacting them with an amount lethal thereto of a compound of the formula:



3,973,010

INSECTICIDAL AND ACARICIDAL COMPOSITION AND METHOD WITH TRIAZOLYL PHOSPHORIC ESTERS ACID

Dag Dawes, Pratteln, and Beat Bohner, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

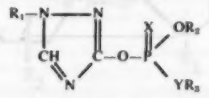
Division of Ser. No. 302,691, Nov. 1, 1972, Pat. No. 3,875,179. This application Jan. 7, 1975, Ser. No. 539,143

Claims priority, application Switzerland, Aug. 24, 1972, 12541/72

Int. Cl.² A01N *9/36*

U.S. Cl. 424—200 10 Claims

1. An insecticidal or acaricidal composition comprising an insecticidally or acaricidally effective amount of a compound of the formula



wherein R_1 represents phenyl substituted by one to five fluorines or halo-lower alkyls, or by one chlorine and one substituent selected from the group consisting of fluorine and halo-lower alkyl; R_2 and R_3 are each lower alkyl; and X and Y are each oxygen or sulfur; together with a suitable carrier therefor.

3,973,011

OXADIAZOLYLPHOSPHORUS COMPOUNDS FOR COMBATTING INSECTS AND ACARIDES

Beat Bohner, Binningen, and Willy Meyer, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

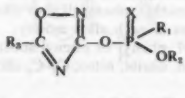
Division of Ser. No. 417,697, Nov. 20, 1973, Pat. No. 3,903,100, which is a continuation-in-part of Ser. No. 230,041, Feb. 28, 1972,. This application June 11, 1975, Ser. No. 585,992

Claims priority, application Switzerland, Mar. 17, 1971, 3930/71; Jan. 25, 1972, 1075/72

Int. Cl.² A01N *9/36*

U.S. Cl. 424—200 10 Claims

1. An insecticidal or acaricidal composition which contains as the active component an insecticidally or acaricidally effective amount of a compound of the formula



wherein R_1 represents C_1–C_4 alkyl or C_1–C_4 alkoxy, R_2 represents C_1–C_4 alkyl, R_3 represents C_1–C_4 alkyl, benzyl or phenyl, and X represents sulphur, together with a suitable carrier therefor.

3,973,012

ORGANOTIN MITICIDAL AND INSECTICIDAL METHOD

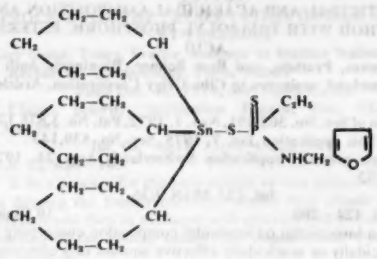
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 466,930, May 6, 1974, Pat. No. 3,917,827, which is a division of Ser. No. 304,871, Oct. 19, 1972, Pat. No. 3,832,370. This application July 30, 1975, Ser. No. 600,340

Int. Cl.² A01N *9/36*

U.S. Cl. 424—203 1 Claim

1. The method which comprises the step of killing insects and mites by contacting them with an amount lethal thereto of a compound of the formula:



3,973,013

SUBSTITUTED S-CARBOXYMETHYL-(THIONO)-(DI)-THIOL-PHOSPHONIC ACID ESTERS AND ESTER-AMIDES AND INSECTICIDAL COMPOSITION AND METHOD

Wolfgang Hofer; Fritz Maurer; Hans-Jochem Riebel; Lothar Rohe, all of Wuppertal; Wolfgang Behrenz, Overath-Steinenbrueck; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

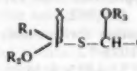
Filed Mar. 10, 1975, Ser. No. 556,984

Claims priority, application Germany, Mar. 15, 1974, 2412429

Int. Cl.² A01N 9/36; C07F 9/40

U.S. Cl. 424—212 10 Claims

1. A substituted S-carboxymethyl(thiono)-(di)-thiolphosphoric(phosphonic) acid ester or ester-amide of the formula



in which

R_1 is phenyl or C_1–C_5 alkyl,

R_2 is C_1–C_6 alkyl, alkoxyalkyl with 1 to 5 carbon atoms in each alkyl moiety or C_5–C_7 cycloalkyl,

R_3 is phenyl; cyclohexyl; C_1–C_7 alkyl; C_1–C_5 halogenoalkyl; or carbalkoxymethyl, phenylalkyl or alkoxyalkyl with 1 to 5 carbon atoms in each alkyl moiety,

R_4 is C_1–C_5 alkyl, phenyl or phenyl substituted by at least one of halogen, nitrile, nitro, C_1–C_4 alkyl and C_1–C_4 alkoxy, and

X is oxygen or sulfur.

3,973,014

THIOLPHOSPHORIC ACID ESTER INSECTICIDE

Jozef Drabek, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

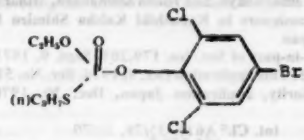
Division of Ser. No. 426,777, Dec. 20, 1973, Pat. No. 3,896,191. This application May 2, 1975, Ser. No. 574,197

Claims priority, application Switzerland, Dec. 22, 1972, 18732/72

Int. Cl.² A01N 9/36

U.S. Cl. 424—225 2 Claims

1. An insecticidal or acaricidal composition comprising an insecticidally or acaricidally effective amount of



together with a suitable carrier therefor.

3,973,015

ANTIBIOTIC A16884

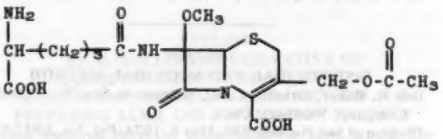
Robert L. Hamill, New Ross; Calvin E. Higgens, and Marvin M. Hoehn, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 60,556, Aug. 3, 1970, Pat. No. 3,719,563, which is a continuation-in-part of Ser. No. 847,923, Aug. 6, 1969, abandoned. This application May 8, 1972, Ser. No. 251,616

Int. Cl.² A61K 31/54

U.S. Cl. 424—246 5 Claims

5. The method for treating *Ascaris lumbricoides* var. suum in a warm-blooded animal which comprises administering to such an animal in need of said treatment an effective, anthelmintic amount of an active agent which is a compound of the formula



or a pharmaceutically acceptable salt thereof.

3,973,016

BLOOD PRESSURE REDUCING HYDROXYPYRIMIDINES

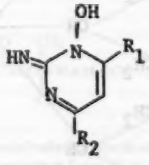
Glenn C. Morrison, Dover, and Wlaczeslaw A. Cetenko, Parsipany, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Aug. 5, 1974, Ser. No. 494,793

Int. Cl.² A61K 31/54; C07D 417/04

U.S. Cl. 424—246 8 Claims

1. A hydroxypyrimidine of the formula



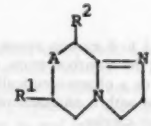
wherein R_1 is lower alkyl or $—NH_2$; and wherein R_2 is

3,973,017
IMIDAZOTHIAZINES, DERIVATIVES AND ANALOGUES THEREOF

Paul S. Anderson, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed July 7, 1975, Ser. No. 593,412
Int. Cl.² C07D *279/16;* **A61K** *31/54*
U.S. Cl. 424—246 **7 Claims**

1. A compound having the structure:



wherein A is selected from the group consisting of S, O, and NR; and wherein R is selected from the group consisting of hydrogen, lower alkyl, or lower alkoxycarbonyl; and R^1 and R^2 are independently selected from the group consisting of hydrogen, halogen, lower alkyl, and lower alkoxy carbonyl; and the pharmaceutically acceptable N-acid addition salts thereof.

3,973,018
FUNGICIDE

Ernst-Heinrich Pommer; Juergen Kradel, both of Limburgerhof; Karl-Heinz Koenig, Frankenthal, and Walter Sanne, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Apr. 3, 1974, Ser. No. 457,580
Claims priority, application Germany, Apr. 17, 1973, 2319362
Int. Cl.² A01N *9/00, 9/12, 9/20, 9/22*
U.S. Cl. 424—248 **12 Claims**

1. A synergistic fungicidal composition consisting essentially of

a. N-tridecyl-2,6-dimethylmorpholine and

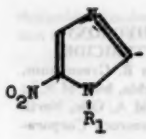
b. manganese zinc ethylenediaminebisdithiocarbamate, the ratio by weight of *a:b* being from 2:1 to 1:4.

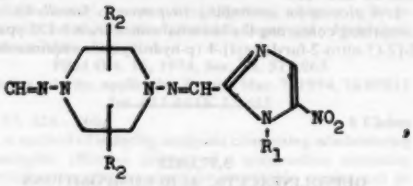
3,973,019
PHARMACEUTICAL COMPOSITIONS CONTAINING 1,4-BIS-(5′-NITROIMIDAZOLYL-2′-METHYLENE-IMINO) PIPERAZINE COMPOUNDS FOR TREATING PROTOZOAL DISEASES AND METHODS FOR TREATING SUCH DISEASES

Erhardt Winkelmann, Kelkheim, Taunus, and Wolfgang Raether, Dreieichenhain, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 425,973, Dec. 19, 1973, Pat. No. 3,903,081. This application Dec. 20, 1974, Ser. No. 535,096
Claims priority, application Germany, Dec. 21, 1972, 2262555
Int. Cl.² A61K *31/495*
U.S. Cl. 424—250 **10 Claims**

1. A pharmaceutical composition for the oral treatment of protozoal diseases caused by *Trichomonas vaginalis* or *Entamoeba histolytica*, which composition comprises from about 10 mg to about 750 mg per dosage unit of a 1,4-bis-(5′-nitroimidazolyl-2′-methylene-imino) piperazine of the formula





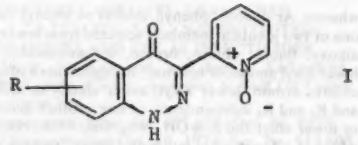
wherein R_1 is hydrogen, methyl, ethyl, or 2-hydroxyethyl and R_2 is hydrogen or methyl, in admixture with a pharmaceutical excipient.

3,973,020
3-(2-PYRIDINYL)-4(1H)-CINNOLINONE N-OXIDES

David T. Connor, Parsippany; Patricia A. Young, Madison, and Maximilian von Strandtmann, Rockaway Township, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

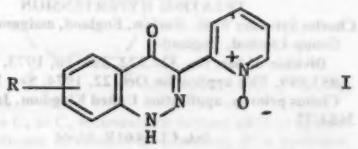
Filed Sept. 8, 1975, Ser. No. 611,120
Int. Cl.² A61K *31/495;* **C07D** *237/28*
U.S. Cl. 424—250 **4 Claims**

1. A compound of the formula I:



wherein R is hydrogen, halogen, lower alkyl, hydroxy or alkoxy; and the pharmaceutically acceptable acid addition salts thereof.

3. A method for treating hyperacidity in mammals which comprises the administration of a sufficient amount of a compound having the formula I:



wherein R is hydrogen, halogen, lower alkyl, hydroxy or alkoxy.

3,973,021
2[2-(5-NITRO-2-FURYL)VINYL]-4-(p-HYDROXY-ANILINO)QUINAZOLINE AS A BACTERICIDE

Herman Horn, Staten Island, N.Y.; Sheldon B. Greenbaum, Livingston; Charles M. Ely, Berkeley Heights, both of N.J.; Walter Hacke, New York, N.Y., and David A. Olle, North Arlington, N.J., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 503,854, Sept. 6, 1974. This application Apr. 14, 1975, Ser. No. 567,499

Int. Cl.² A61K *31/505*

U.S. Cl. 424—251 1 Claim

1. A process for controlling *Streptococcus faecalis* bacteria comprising contacting the bacteria with at least 0.125 ppm of 2-[2-(5-nitro-2-furyl)vinyl]-4-(p-hydroxyanilino)quinazoline.

3,973,022
QUINOLINEACETIC ACID COMPOSITIONS

Richard Goschke, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

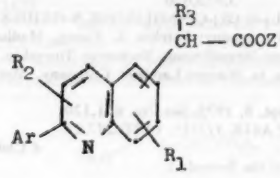
Division of Ser. No. 337,998, March 5, 1973, Pat. No. 3,897,436. This application Apr. 29, 1975, Ser. No. 573,274

Claims priority, application Switzerland, Mar. 10, 1972, 3549/72; Jan. 29, 1973, 1230/73

Int. Cl.² A61K *31/47*

U.S. Cl. 424—258 18 Claims

1. An anti-inflammatory or analgesic pharmaceutical composition comprising an anti-inflammatory or analgesically effective amount of a compound corresponding to the formula



(I)

wherein Ar denotes phenyl, thienyl or phenyl substituted by one or two identical members selected from lower alkyl, lower alkoxy, fluoro, chloro, bromo, trifluoromethyl, amino, di-lower alkyl amino, or hydroxy, R_1 represents hydrogen, fluoro, chloro, bromo, lower alkyl, lower alkoxy or trifluoromethyl and R_2 and R_3 independently of one another denote hydrogen or lower alkyl and Z is OH, NH_2, OR, NHR, NRR or NHOH, where R is lower alkyl in which "lower" defines one to seven carbon atoms, or a pharmaceutically acceptable non-toxic salt thereof and a pharmaceutical carrier.

3,973,023
ANTI-HYPERTENSIVE POLYCYCLIC COMPOUNDS FOR TREATING HYPERTENSION

Charles Sylvester Fake, Harlow, England, assignor to Beecham Group Limited, England

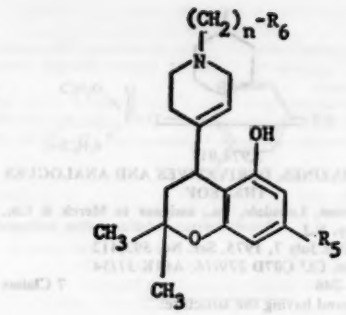
Division of Ser. No. 324,222, Jan. 10, 1973, Pat. No. 3,853,899. This application Oct. 22, 1974, Ser. No. 517,001

Claims priority, application United Kingdom, Jan. 26, 1972, 3654/72

Int. Cl.² A61K *31/44*

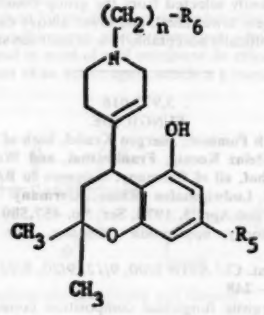
U.S. Cl. 424—263 14 Claims

1. A pharmaceutical composition useful for treating hypertension in humans and animals which comprises an antihypertensively effective amount of a compound of the formula:



wherein R_5 is alkyl of 5 to 8 carbon atoms which is straight chained or branched at the α-carbon atom, *n* is 1 or 2 and R_6 is phenyl or naphthyl, or a pharmaceutically acceptable salt thereof, in combination with a pharmaceutically acceptable nontoxic inert diluent or carrier.

8. A method of treating hypertension in humans and animals which comprises administering to such human or animal an antihypertensively effective amount of a compound of the formula



wherein R_5 is alkyl of 5 to 8 carbon atoms which is straight chained or branched at the α-carbon atom, *n* is 1 or 2 and R_6 is phenyl or naphthyl, or a pharmaceutically acceptable salt thereof.

3,973,024
ANALGESIC AND ANTI-INFLAMMATORY ANILINO-PHENYLACETIC ACID-(2,3 OR 4 PYRIDYL)-METHYL ESTERS AND DERIVATIVES

Georges Haas, Oberwil, and Alfred Sallmann, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

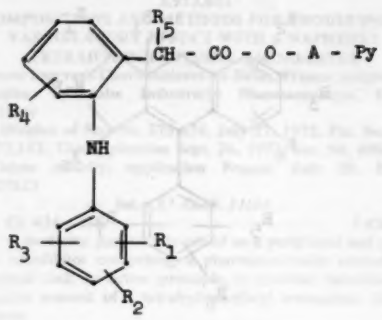
Division of Ser. No. 387,405, Aug. 10, 1973, Pat. No. 3,897,437. This application Apr. 28, 1975, Ser. No. 572,555

Claims priority, application Switzerland, Aug. 16, 1972, 12128/72

Int. Cl.² A61K *31/44*

U.S. Cl. 424—263 10 Claims

1. A pharmaceutical anti-inflammatory and analgesic preparation, comprising an anti-inflammatory and analgesically effective amount of an ester of the formula



in which R_1 represents lower alkyl, lower alkoxy, halogen up to and including atomic number 35 or trifluoromethyl, R_2 represents hydrogen or a substituent corresponding to the definition of R_1, R_3 represents hydrogen, lower alkyl, lower alkoxy, halogen up to and including atomic number 35, R_4 represents hydrogen, lower alkyl, lower alkoxy, halogen up to and including atomic number 35 or trifluoromethyl, R_5 represents hydrogen, lower alkyl or benzyl, A represents a direct bond, lower alkylene or lower alkylidene and Py represents unsubstituted, lower alkyl-substituted or lower alkoxy-substituted pyridyl, wherein "lower" denotes said straight-chain radicals with up to 4 carbon atoms; the N-oxide or a pharmacologically tolerable acid addition salt thereof, together with a pharmaceutical excipient.

3,973,025

1,4-DIHYDRO-3,5-PYRIDINE DICARBONITRILE DERIVATIVES

Terence James Ward, Slough, England, assignor to John Wyeth and Brother Limited, Maidenhead, England

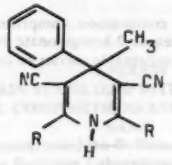
Filed Apr. 29, 1975, Ser. No. 572,672

Claims priority, application United Kingdom, May 17, 1974, 22451/74

Int. Cl.² A01N 9/22

U.S. Cl. 424—263 **4 Claims**

1. A dihydropyridine of formula



(I)

where each R is lower alkyl.

3,973,026

INHIBITOR OF BLOOD PLATE AGGREGATION

Giovanni Orzalesi, and Renato Selleri, both of Florence, Italy, assignors to Societa Italo-Britannica L. Manetti-H. Roberts & C., Italy

Filed Feb. 5, 1975, Ser. No. 547,248

Int. Cl.² A61K 31/44

U.S. Cl. 424—263 **2 Claims**

1. A composition effective for inhibition of blood platelet aggregation comprising N,N'-bis(3-picolyl)-4-methoxyisophthalamide dissolved in a liquid vehicle at a molar concentration of 5.2×10^{-4} moles.

3,973,027

ANALGESIC METHOD CONTAINING LYSINE 2-(2-METHYL-3-CHLORO-ANILINO)-3-NICOTINATE

Pier Nello Ferrari, Buenos Aires, Argentina, assignor to Roemmers Sociedad Anonima Industrial, Comercial y Financiera, Buenos Aires, Argentina

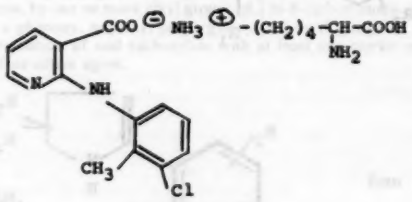
Filed Oct. 15, 1974, Ser. No. 515,065

Claims priority, application France, Mar. 7, 1974, 74.07817

Int. Cl.² A61K 31/455

U.S. Cl. 424—266 **6 Claims**

1. A method of inducing analgesia comprising administering an analgesic effective amount of a composition consisting essentially of a pharmaceutically acceptable carrier and an active principle, the active principle being 2-(2-methyl-3-chloro-anilino)-lysine nicotinate having the formula:



3,973,028

1-DIMETHYLCARBAMYL-3-BRANCHED ALKYL-1,2,4-TRIAZOL-5-YL-(N-SUBSTITUTED) SULFONAMIDES AND USE AS INSECTICIDES

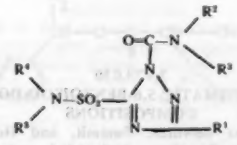
William C. Doyle, Jr., Leawood, and Joel L. Kirkpatrick, Overland Park, both of Kans., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 407,678, Oct. 18, 1973, abandoned. This application Oct. 10, 1974, Ser. No. 513,605

Int. Cl.² A01N 9/00

U.S. Cl. 424—269 **14 Claims**

1. The method of killing aphids on plants comprising applying to the plants a substantially non-phytotoxic but aphicidally effective amount of a compound having the generic structural formula



in which R^1 is C_3 to C_4 secondary or tertiary alkyl or cycloalkyl, R^2 is hydrogen or methyl, R^3 is methyl, R^4 is hydrogen, methyl or ethyl, R^5 is methyl or ethyl, with the added provision that when R^1 is tert.butyl, R^4 may also be C_3 or C_4 alkyl or cycloalkyl, and R^5 may also be C_3 or C_4 alkyl or cycloalkyl or phenyl.

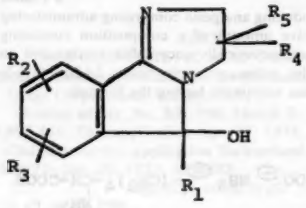
3,973,029

HYPERGLYCEMIA THERAPY II

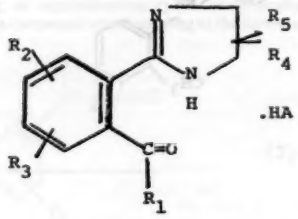
Harry Rosen, Drexel Hill, Pa., assignor to American Home Products Corporation, New York, N.Y.

Continuation of Ser. No. 497,805, Aug. 15, 1974, abandoned. This application May 19, 1975, Ser. No. 578,794
The portion of the term of this patent subsequent to Dec. 23, 1992, has been disclaimed.
Int. Cl.² A61K *31/415*
U.S. Cl. 424—273 1 Claim

1. The method of treating hyperglycemia in a warm-blooded animal suffering from hyperglycemia which comprises orally or parenterally administering to said animal an effective amount for treating hyperglycemia of a compound of the following formulae



and



wherein R_4 and R_5 are each lower alkyl and attached to the same carbon atom; R_2 is selected from the group consisting of hydrogen, halogen, amino, lower alkylamino, lower alkyl, and lower alkoxy; R_3 is hydrogen when R_2 and R_3 are dissimilar and when R_2 and R_3 are the same they are both selected from the group consisting of hydrogen, halogen, lower alkyl, and lower alkoxy; R_1 is selected from the group consisting of phenyl, monohalophenyl, dihalophenyl, trifluoro-methylphenyl, mono(lower)alkoxyphenyl, and di(lower)alkoxyphenyl; and HA is a pharmaceutically acceptable acid.

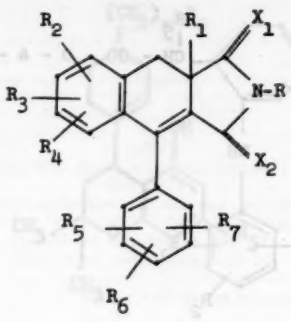
3,973,030

ANTIASTHMATIC 5,6-BENZOISOINDOLINE COMPOSITIONS

Robert Mathews Bowman, Summit, and Heinz Werner Gschwend, New Providence, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 29, 1973, Ser. No. 410,940
Int. Cl.² A61K *31/40*
U.S. Cl. 424—274 2 Claims

1. A pharmaceutical composition comprising an antiasthmatically effective amount of a compound of the formula



in which R is methyl or ethyl, each of R_1, R_2, R_3 and R_4 is hydrogen or methyl, each of R_5, R_6 and R_7 is hydrogen or methoxy, or R_3 and R_4, as well as R_5 and R_6, when taken together, are methylenedioxy, and R_2 and R_7 are hydrogen, whereby at least one of R_1 to R_7 being different from hydrogen, and both of X_1 and X_2 are two hydrogen atoms, or a therapeutically acceptable acid addition salt thereof, together with a pharmaceutical excipient.

3,973,031

GULONIC ACID SALT

Jean Louis Molle, Villeurbanne-St. Georges, and Jean Christian Boch, Neris-les-Bains, both of France, assignors to A.E.C. Societe de Chimie Organique et Biologique, Paris, France

Division of Ser. No. 396,803, Sept. 13, 1973, Pat. No. 3,910,960. This application Jan. 27, 1975, Ser. No. 544,572
Claims priority, application France, Sept. 15, 1972, 72.32896
Int. Cl.² A61K *31/335*
U.S. Cl. 424—278 4 Claims

1. A pharmaceutical composition comprising, as active ingredient, calcium diacetone-2-ketogulonate in association with a pharmaceutically acceptable carrier or coating.

3,973,032

TREATMENT OF CITRUS TREE DISEASES

Chester D. Leonard, Lake Alfred, Fla., assignor to Board of Regents, State of Florida for and on behalf of the University of Florida, Gainesville, Fla.

Filed Sept. 19, 1975, Ser. No. 615,036
Int. Cl.² A01N *9/28*
U.S. Cl. 424—280 13 Claims

1. A method of treating a citrus tree afflicted with Young Tree Decline which comprises applying to the foliage of said afflicted tree an effective amount of a compound selected from the group consisting of ascorbic acid, erythorbic acid and alkali metal and ammonium salts thereof.

3,973,033
COMPOSITIONS AND METHODS FOR PRODUCING A VASODILATORY EFFECT WITH A NAPHTHYL TETRAHYDROFURFURYL AMINO-ESTER

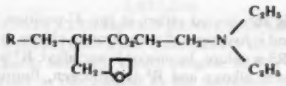
Etienne Szarvasi, Charbonnieres-les-Bains, France, assignor to Lipha, Lyonnaise Industrielle Pharmaceutique, Lyon, France

Division of Ser. No. 275,638, July 27, 1972, Pat. No. 3,872,112. This application Sept. 26, 1973, Ser. No. 400,918
Claims priority, application France, July 29, 1971, 71.27823

Int. Cl.² A61K *31/34*

U.S. Cl. 424—285 **7 Claims**

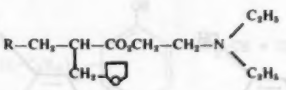
1. A medicine particularly useful as a peripheral and cerebral vasodilator comprising a pharmaceutically acceptable excipient and, as active principle, a cerebral vasodilatory-effective amount of a tetrahydrofurfuryl aminoester of the formula:



in which R is a member of the group consisting of the 2-naphthyl radical, the 6-alkoxy-2-naphthyl radical, and the 5, 6, 7, 8-tetrahydro-1-naphthyl radical.

6. A method of producting a vasodilatory effect in a patient in need of said therapy comprising:

administering, in unit dosage form, to a patient in need of said therapy, a vasodilatory-effective non-toxic amount of a tetrahydrofurfuryl aminoester of the formula:



in which R is a member of the group consisting of the 2-naphthyl radical, the 6-alkoxy-2-naphthel radical, and the 5, 6, 7, 8-tetrahydro-1-naphthyl radical.

3,973,034
CERTAIN STABILIZED DITHIOCARBOMATE PESTICIDAL COMPOSITIONS AND METHODS OF USING SAME

John D. Buckman, and John D. Pera, both of Memphis, Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.

Continuation-in-part of Ser. No. 246,961, April 24, 1972, Pat. No. 3,856,851. This application May 28, 1974, Ser. No. 473,618

Int. Cl.² A01N *9/12, 9/20*

U.S. Cl. 424—286 **15 Claims**

1. A stable bactericidal and fungicidal composition comprising as the active component thereof a water soluble salt selected from the group consisting of a potassium or a sodium N-hydroxymethyl-N-alkyldithiocarbamate wherein the alkyl group contains from 1 to 5 carbon atoms and a dipotassium or a disodium N,N′-bishydroxymethyl-N,N′-alkylenebisdithiocarbamate wherein the alkylene group contains from 2 to 4 carbon atoms and sufficient water to dissolve said active component plus an alkaline material in an amount sufficient to stabilize the resulting solution.

3,973,035
CYANOBENZYL CYCLOPROPANE CARBOXYLATE PESTICIDES

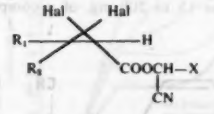
Robert J. G. Searle; Roger E. Woodall, both of Sittingbourne, and Michael J. Bull, Lower Halstow, all of England, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 469,134, May 13, 1974, Pat. No. 3,914,274. This application June 23, 1975, Ser. No. 589,284
Claims priority, application United Kingdom, May 15, 1973, 22970/73

Int. Cl.² A01N *9/06, 9/20*

U.S. Cl. 424—304 **5 Claims**

1. A method of combating insect or acarid pests at a locus which comprises applying to the locus a pesticidally effective amount of a cyanobenzyl cyclopropane carboxylate of the formula



wherein Hal represents a chlorine atom; R_1 and R_2 each represents an alkyl group of 1 to 6 carbon atoms; and X represents a phenyl group optionally substituted by one or more chlorine atoms, by one or more alkyl groups of 1 to 6 carbon atoms or by a phenoxy, tolyloxy, propargyloxy or benzyl group, or a composition of said carboxylate with at least one carrier or surface-active agent.

3,973,036
CYCLOPROPANECARBOXYLIC ACID ESTERS

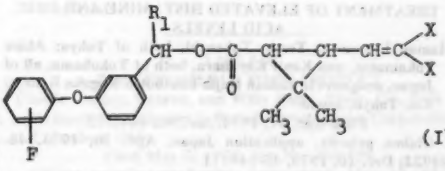
Masachika Hirano, Ashiya; Takashi Matsuo, Nishinomiya; Hisami Takeda, and Toshio Nishioka, both of Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 6, 1975, Ser. No. 620,188
Claims priority, application Japan, Oct. 24, 1974, 49-123244

Int. Cl.² A01N *9/20, 9/24;* **C07C** *69/74, 121/75*

U.S. Cl. 424—304 **7 Claims**

1. A compound of the formula (I),



(I)

wherein R_1 is a hydrogen atom, a cyano or ethynyl group, and X is a chlorine, bromine or fluorine atom.

3,973,037

HYDRATROPIC ACID DERIVATIVES IN THE TREATMENT OF NON-INFLAMMATORY ALLERGIC REACTIONS

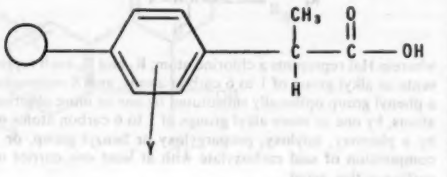
Margaret E. Greig, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 479,213, June 14, 1974, Pat. No. 3,865,949, which is a continuation-in-part of Ser. No. 384,819, Aug. 2, 1973, abandoned, which is a continuation of Ser. No. 258,353, May 31, 1972, abandoned. This application Feb. 7, 1975, Ser. No. 547,922

Int. Cl.² A61K *31/19*

U.S. Cl. 424—317 5 Claims

1. A process for the therapeutic treatment of a non-inflammatory allergic reaction selected from the group consisting of allergic rhinitis, food allergy and drug allergy in a human suffering therefrom comprising the systemic administration to said human of from 15 to 200 mg. of a compound of the formula:



wherein

is cyclohexane or

and X and Y can be the same or different and are hydrogen, fluoro, chloro, bromo, alkyl of from 1 to 8 carbon atoms, inclusive, or alkoxy of from 1 to 8 carbon atoms, inclusive, and a pharmacologically acceptable salt thereof in association with a pharmaceutical carrier.

3,973,038

TREATMENT OF ELEVATED HISTAMINE AND URIC ACID LEVELS

Hamao Umezawa; Tomio Takeuchi, both of Tokyo; Akira Takamatsu, and Kenji Kayahara, both of Yokohama, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

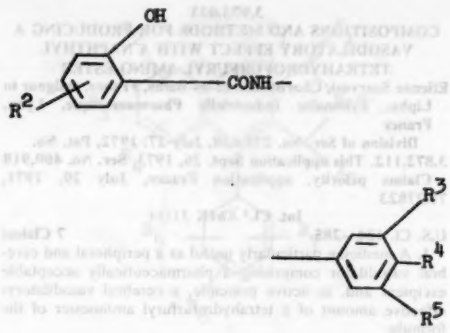
Filed Apr. 17, 1974, Ser. No. 461,772

Claims priority, application Japan, Apr. 20, 1973, 48-44922; Dec. 10, 1973, 48-140111

Int. Cl.² A61K *31/165*

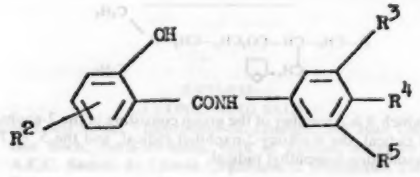
U.S. Cl. 424—324 16 Claims

1. A method for chemotherapeutically treating a living animal having a biochemical disorder characterized by an abnormally high body level of histamine which comprises administering a compound having the formula



wherein R^2 is substituted either at the 4′-position or at the 5′-position and is hydrogen, fluoro, bromo, chloro, hydroxy or lower alkyl; R^3 is chloro, bromo or lower alkyl; R^4 is hydroxy, amino or lower alkoxy and R^5 is hydrogen, fluoro, bromo, chloro or lower alkyl to said animal in a dosage sufficient to lower said histamine level.

9. A method for chemotherapeutically treating a living animal having a biochemical disorder characterized by an abnormally high body level of uric acid which comprises administering a compound having the formula



wherein R^2 is substituted either at the 4′-position or at the 5′-position and is hydrogen, fluoro, bromo, chloro, hydroxy or lower alkyl; R^3 is chloro, bromo or lower alkyl; R^4 is hydroxy, amino or lower alkoxy; R^5 is hydrogen, fluoro, bromo, chloro or lower alkyl to said animal in a dosage sufficient to lower said uric acid level.

3,973,039

[(2-ALKOXYBENZYLIDINE)AMINO]GUANIDINES AND THEIR ANTICOCCIDIAL USE

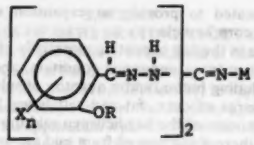
John E. Livak, Rutland, Vt., and Paul B. Budde, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 3, 1975, Ser. No. 546,850

Int. Cl.² C07C *133/12*; A61K *31/155*

U.S. Cl. 424—326 18 Claims

1. A [(substituted-2-alkoxybenzylidine)amino]-guanidine compound and the pharmacologically acceptable acid addition salts thereof, the guanidine compound corresponding to the formula



wherein R represents methyl, ethyl or benzyl; X represents chloro, bromo, amino, dimethylamino, diethylamino or acetamido; M represents hydrogen and *n* represents an integer of 1 or 2 with the proviso that when *n* is 1, the X representation is in the 4 ring position and when *n* is 2, the X representations are in any of the 3, 4 or 5 ring positions.

3,973,040

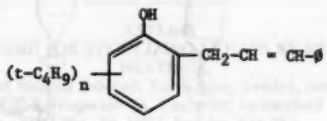
CERTAIN CINNAMYL PHENOLS AS GROWTH INHIBITORS FOR MOSQUITO LARVAE

Leonard Jurd, Berkeley, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed July 8, 1975, Ser. No. 594,168
Int. Cl.² A01N *9/26*
U.S. Cl. 424—346 **12 Claims**

1. A method of inhibiting growth of mosquito larvae, which comprises

applying to said larvae an effective growth-inhibiting amount of a compound of the structure



wherein *n* is 2 or 3.

3,973,041

SUGARLESS CHEWING GUM HAVING IMPROVED SHELF LIFE

James Wix DuRoss, Claymont, Del., assignor to ICI United States Inc., Wilmington, Del.

Filed Mar. 3, 1976, Ser. No. 663,517
Int. Cl.² A23G *3/30*
U.S. Cl. 426—3 **4 Claims**

1. A sugarless chewing gum formula having incorporated therein an amount of sorbitol in the gamma crystalline polymorph sufficient to extend original softness characteristics when stored at relative humidities ranging between 33 and 75 percent beyond that which would normally be obtained for similar compositions containing powdered sorbitol in the amorphous or mixed crystal polymorphic modifications.

3,973,042

FLAVOR DEVELOPMENT BY MICROBIAL LIPASES IN PASTEURIZED MILK BLUE CHEESE

Frank V. Kosikowski, and Ramesh C. Jolly, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed May 10, 1974, Ser. No. 468,863
Int. Cl.² A23C *19/12*
U.S. Cl. 426—35 **7 Claims**

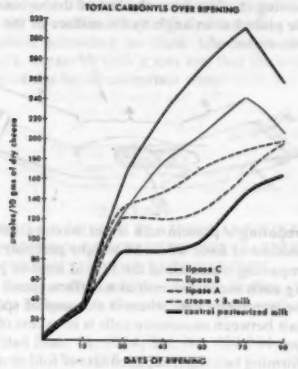
1. The method for producing blue cheese from pasteurized or heat-treated milk, which comprises in the recited sequence the steps of

a. preparing loose cheese curds from said milk;

b. introducing into the loose curds a mixture, by weight of curd, of:

1. a food grade lipase selected from the group consisting of food grade microbial lipase and animal lipase, and

2. Penicillium species mold spores, the amounts of lipase and Penicillium mold spores being sufficient to substantially reduce the time required for curing of the cheese while obtaining optimum cheese flavor characteristics to the resultant product; and



c. incubating the resultant product from step (b) at high relative humidity to permit the outgrowth of mold spores and activity of the added lipase, whereby a highly flavored blue cheese product is obtained.

3,973,043

FEEDLOT ANIMAL WASTES INTO USEFUL MATERIALS

Howard D. Lynn, 221 Star, Hereford, Tex. 79045

Filed July 31, 1975, Ser. No. 600,919
Int. Cl.² A23K *1/00*
U.S. Cl. 426—55 **17 Claims**

1. A process for converting feedlot fecal waste materials having indigenous microorganisms contained therein into useful materials which comprises:

a. collecting said feedlot fecal waste materials and adding water thereto to form a slurry;

b. subjecting said slurry to an anaerobic fermentation process for a period of time to produce a methane containing gas and a first residue material;

c. separating said methane containing gas from said first residue material;

d. thereafter subjecting said first residue material to an aerobic fermentation to produce an edible animal feed and a second residue material; and

e. separating said animal feed from said second residue material.

3,973,044

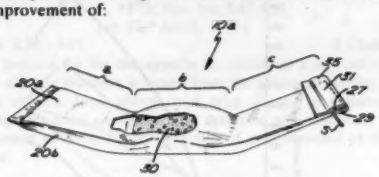
PROTEINACEOUS FOOD PRODUCT

Claude Giddey, Geneva, and Willy Rufer, Onex, GE, both of Switzerland, assignors to Battelle Development Corporation, Columbus, Ohio

Filed May 3, 1974, Ser. No. 466,539
Claims priority, application Switzerland, May 11, 1973, 6701/73
Int. Cl.² A23G *1/00*; A23J *3/00*
U.S. Cl. 426—104 **13 Claims**

1. In a process of forming a proteinaceous product comprising:

a. preparing a mixture of protein and water;
b. forming the mixture into a film by passing the mixture between a series of smooth parallel and adjacent rotating rolls, where the film transfers sequentially from one roll to the next roll,
c. providing each roll in the sequence with (1) a greater surface speed than the preceding roll and (2) a direction of rotation opposite to that of the preceding roll; and
d. removing the film from the last of the series of rolls by a blade placed at an angle to the surface of the last roll, the improvement of:



i. preparing a protein and water mixture having a water content of from 40 to 80 weight percent;
ii. imparting a stretch to the film at least in part by rotating each successive roll at a surface speed greater than the preceding roll, wherein the sum of speed differentials between successive rolls is in excess of 40 percent; and
iii. forming two superimposed sets of fold structures in the film as it is removed by the blade with the smaller set of folds being superimposed on the larger folds.

3,973,045

POPCORN PACKAGE FOR MICROWAVE POPPING

Lawrence C. Brandberg, and David W. Andreas, both of Minneapolis, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed May 14, 1973, Ser. No. 359,810
Int. Cl.[2] B65B *25/22*
U.S. Cl. 426—110 **5 Claims**

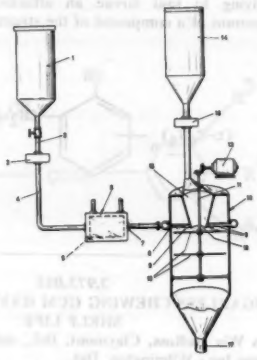
1. A package of popcorn within a bag which functions as a popping container ready for popping in a microwave oven comprising in combination,
a. an expandable package formed from a paper bag provided with longitudinally extending gussets therein to promote the expansion of the bag,
b. a layer of grease proof flexible sheet material lining the bag to prevent oil absorption by the paper during storage and microwave popping therein,
c. said bag being sealed transversely along the bottom thereof and being folded downwardly along the top edge thereof to retain the top portions of the gussets in place when the bag expands,
d. a transversely extending tape means adhesively bonded to the downwardly folded portion and to a portion at the top of the bag adjacent to and immediately below the downwardly folded portion, the top of the bag gussets being held in place by the downwardly folded section of the top edge of the bag and the tape means,
e. a rip means attached to the bag for opening the bag,
f. said bag having no steam exhaust opening therein, thereby allowing internal pressure to develop to expand the bag when heated to provide an expansion space for the popped corn kernels,
g. a charge in the bag consisting essentially of about 8 parts of popcorn in an unpopped condition, about 3 parts of fat, excluding butter, and a quantity of salt,
h. said charge of corn, fat and salt being located in the center portion of the bag between said top edge and said bottom thereof and spaced from said top and said bottom edges whereby at least 75% of the corn will pop when placed in a microwave oven having a capacity of 600 to about 1400 watts with less than about 5% of the kernels being scorched during popping.

3,973,046

METHOD FOR PREPARING A MIXTURE OF FINELY CRYSTALLIZED FAT AND A POWDER

Jan Mol, Ermelo, Netherlands, assignor to N.V. Houdstermaatschappij Holland Agro, The Hague, Netherlands

Continuation-in-part of Ser. No. 264,561, June 20, 1972, abandoned. This application July 7, 1975, Ser. No. 593,565
Claims priority, application Netherlands, June 23, 1971, 7108689
Int. Cl.[2] A23L *1/00*
U.S. Cl. 426—289 **17 Claims**



1. A method for preparing a mixture of a finely crystallized fat and a powder selected from the group consisting of at least one of skimmed milk powder, whey powder, starch, dextrose, maltose, saccharose, soya flour, fish solubles, protein, and caseinates comprising:
a. cooling the fat from a predominantly molten condition to a temperature below its gel point to partially crystallize the fat into a plastic mass;
b. shaping the partially crystallized fat by extrusion through an extrusion orifice into ribbons into a space into which the powder is supplied from above and in which knives are rotating on a vertical shaft;
c. dividing the ribbons into small fat particles by cutting with said rotating knives immediately after the ribbons emerge from the extrusion orifice; and
d. simultaneously with said dividing of the ribbons, uniformly mixing the divided emerging ribbons of fat with the powder in said space in a weight ratio between 2:4 and 1:8 without further cooling of the fat and without entirely coating the fat particles with the powder to form a mixture which can be readily dispersed in an aqueous fluid.

3,973,047

PROCESS OF DEHYDRATING VEGETABLES

Jack R. Linaberry, and John A. Frane, both of Modesto, Calif., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 316,802, Dec. 20, 1972, abandoned, which is a continuation of Ser. No. 26,069, April 6, 1970, abandoned. This application Apr. 18, 1974, Ser. No. 461,830

Int. Cl.² A23B 7/02, 7/06

U.S. Cl. 426—473 14 Claims

1. A process of preparing dehydrated vegetables which are substantially free of microbiological contamination and have quality attributes of color, flavor, texture, and ease of rehydration which comprises subjecting vegetables to partial dehydration with hot air at a temperature of from about 130°F. to about 250°F. to a moisture content less than about 30%; contacting the partially dehydrated vegetables with a hot humid gaseous medium not exceeding 180°F. wet bulb temperature ranging from about 200°F. d.b./180°F. w.b. to about 140°F. d.b./120°F. w.b. and maintained at a moisture level sufficient to realize bacteria kill for a time period less than 12 minutes and at a temperature sufficient to reduce microbiological contamination but insufficient to cause heat damage to the product under wet and dry bulb thermometry control which avoid evaporative cooling or condensation during said contact, the partially dried product temperature being thereby increased to 140°F. or above and to the circulating air wet bulb temperature or higher and any product moisture reduction (expressed as a weight percent of the product before and after said decontamination) ranging between 0–12%, and subjecting the thusly contacted partially dehydrated vegetables to dehydration with less humid hot air at a dry bulb temperature of from about 110°F. to about 160°F. to a moisture content of less than about 8%.

3,973,048

METHOD FOR STERILIZING LIQUIDS BY BRIEF HEATING

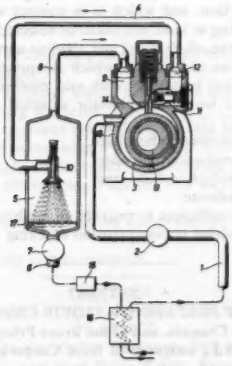
Sören Elof Mauritz Sollerud, Norrkoping, Sweden, assignor to Tetra Pak Development SA, Lausanne, Switzerland

Filed Dec. 20, 1974, Ser. No. 534,961

Claims priority, application Switzerland, Dec. 21, 1973, 18104/73

Int. Cl.² A23L 3/16

U.S. Cl. 426—522 13 Claims



1. A method for sterilizing liquids by brief heating, comprising exposing a pressurized stream of already sterilized liquid to a pressure reduction, an evaporable partial quantity of the liquid being induced to assume vapour form while the remaining part of the liquid quantity is cooled, introducing vapour thus formed into a compressor in which said vapour is compressed and is heated due to said compression and is mixed with and condensed in a stream of pressurized liquid which is supplied to the compressor and, by being mixed with warm condensate, is raised to a temperature which is equal to or exceeds that required for sterilization, and maintaining the sterilization temperature of the said heated and pressurized stream of liquid for the length of time required for sterilization, whereupon the liquid is subjected to the initially-mentioned pressure reduction during which an evaporable part quantity of the liquid is evaporated and is again subjected to the treatment cycle while the remaining and simultaneously cooled quantity of sterilized liquid is drained off.

10. A method according to claim 1, wherein the liquid comprises milk, cream or fruit juices and that the evaporable part quantity of the liquid comprises water.

3,973,049

METHOD OF MIXING FLAVORS AND FIXED COMPOSITION COMPRISING DERIVATIZED SYNTHETIC POLYSACCHARIDES

Ivan Furda, Pleasantville, and Peter Donato Malizia, Yonkers, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 14, 1974, Ser. No. 450,944

Int. Cl.² A23L 1/22

U.S. Cl. 426—533 6 Claims

1. A method of improving the stability of a water insoluble flavor, oil and hydrophobic flavor against oxidation which method comprises fixing said flavors to a highly branched polymerized polysaccharide having been prepared by the acid catalyzed polymerization of a reducing sugar which polymerized polysaccharide has been further esterified with substituted dicarboxylic acid anhydride.

3,973,050

CONTAINING LACTITOL AS A SWEETENER

Ken Hayashibara, and Kaname Sugimoto, both of Okayama, Japan, assignors to Hayashibara Company, Okayama, Japan

Filed Jan. 8, 1969, Ser. No. 789,934

Claims priority, application Japan, Jan. 16, 1968, 43-2279

Int. Cl.² A21D 13/08

U.S. Cl. 426—552 6 Claims

1. A low-caloric carbonated soft drink containing a low caloric sweetening agent and a body producing agent, wherein both said agents consist essentially of lactitol.

3,973,051

PECTATE GELLED FOOD PRODUCTS AND METHOD

Keith Buckley, Melton Mowbray, and John Richard Mitchell, East Leake, both of England, assignors to Mars Limited, London, England

Filed Apr. 14, 1975, Ser. No. 568,119

Claims priority, application United Kingdom, Apr. 18, 1974, 17082/74

Int. Cl.² A23L 1/04, 1/31

U.S. Cl. 426—574 19 Claims

1. A food product comprising solid foodstuff and an aqueous phase, the aqueous phase having a pH value in the range 5 to 8.5 and being thickened or gelled by a pectate having a degree of esterification below 10% and at least one non-toxic di- or tri-valent metal ion.

3,973,052

POTASSIUM ISOHUMULATE HOP EXTRACTS

William Mitchell, Hatfield, England, assignor to Bush Boake Allen Limited, London, England

Continuation of Ser. No. 355,160, April 27, 1973, abandoned, which is a continuation of Ser. No. 129,587, March 30, 1971, abandoned, which is a division of Ser. No. 629,905, April 11, 1967, Pat. No. 3,607,298, which is a continuation-in-part of Ser. No. 359,788, April 14, 1964, abandoned. This application Jan. 8, 1975, Ser. No. 539,440

Claims priority, application United Kingdom, Sept. 16, 1963, 36382/63

The portion of the term of this patent subsequent to Apr. 6, 1993, has been disclaimed.

Int. Cl.² C12C 9/02

U.S. Cl. 426—592 9 Claims

1. A stable aqueous hop extract suitable for bittering beer, the said aqueous hop extract consisting essentially of potassium isohumulate and between 16% and 72% by weight of water and being substantially free from fixed hop seed oil.

3,973,053

PROCESS FOR TEMPERING BEADED FAT QUICKLY

Thom B. Galusky, Downers Grove, Ill., and Juan B. Ilagan, Jr., Middleburg Heights, Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Sept. 24, 1975, Ser. No. 616,194

Int. Cl.² A23B 4/10; A23L 1/22

U.S. Cl. 426—601 8 Claims

1. A process for tempering particulates having crystallizable, continuous polymorphic fatty phase, at least the exteriors of said particulates having been crystallized rapidly to yield an unstable crystal form of said fatty phase, which comprises:

forming said particulates; admitting said formed particulates into a fluidized bed; supporting said particulates with cooling gas at a temperature and for a time sufficient for said cooling gas to absorb heat of transformation of said particulates into a stabler crystal form, the outlet temperature of said cooling gas being less than the Wiley Melting Point of said stabler crystal form; venting spent cooling gas from said bed; and withdrawing tempered particulates from said bed whereby withdrawn tempered particulates resist appreciable agglomeration upon their collection.

3,973,054

FEEDSTUFF FOR FOWL, FISH AND DOMESTIC ANIMALS

Chukei Komakine, 13-10, Aza Sugidaira, Taira, Dwaki, Fukushima, Japan

Filed Apr. 21, 1975, Ser. No. 569,848

Int. Cl.² A23K 1/175

U.S. Cl. 426—641 4 Claims

1. A method of producing an odorless feedstuff for fowl, fish and domestic animals comprising mixing 100 parts by weight of crude droppings from fowl, 30 to 40 parts by weight of waste portions of fowl, fish and domestic animals which remain after removal of useful meat, and about 10 parts by weight of coarse powder of crystalline ferrous sulfate heptahydrate; steaming and agitating the mixture under a gauge pressure of 2 to 3 kg/cm² and a temperature of 250° to 300°C for 1 to 2 hours; and cooling the steamed mixture at atmospheric pressure to produce said odorless feedstuff.

3,973,055

PROCESS OF MANUFACTURE OF DIELECTRIC RECORDING MEDIA

Albert H. Markhart, and David R. Cahill, both of Wilbraham, Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 339,448, March 8, 1973, abandoned. This application Jan. 27, 1975, Ser. No. 544,255

Int. Cl.² C09C 3/00; G03G 7/00

U.S. Cl. 427—58 23 Claims

1. In a process of manufacture of a dielectric recording medium by coating an electroconductive substrate with a dielectric resin, the step comprising dispersing an organophilic clay pigment in the dielectric resin to provide a humidity resistant medium possessing a matte surface; wherein the organophilic clay pigment is a finely divided calcined kaolin clay which has been reacted with an organotitanium compound containing at least two hydrolyzable groups, the organotitanium compound being represented by the formula: wherein R is a hydrocarbon radical containing from 1 to 12 carbon atoms and R′ is OCOR″, OR‴ or OSiR‴, wherein R″ is a substituted or unsubstituted hydrocarbon radical having from 1 to 40 carbon atoms and wherein R‴ is a substituted or unsubstituted hydrocarbon radical having from 6 to 50 carbon atoms providing that R‴ and R are not identical and wherein *m* is an integer of 2 or 3; wherein the dielectric resin is a polyvinyl butyral of weight average molecular weight in the range of 20,000 to 500,000 containing from 9 to 21 weight percent "vinyl alcohol" and less than 10 weight percent vinyl acetate; and wherein the weight ratio of dielectric resin to organophilic clay pigment is in the range of 7:3 to 1:8.

3,973,056

INHIBITION OF STRESS-CORROSION CRACKING OF STEEL PIPELINE

Raymond Roy Fessler; Warren Elmer Berry, both of Columbus; Russell Lee Wenk, Westeville, all of Ohio, and Redvers Nicholson Parkins, Newcastle-upon-Tyne, England, assignors to American Gas Association, Inc., Arlington, Va.

Filed June 6, 1974, Ser. No. 477,169

Int. Cl.² F16L 58/04; C23F 13/00

U.S. Cl. 427—136 20 Claims

1. A method for inhibiting stress-corrosion cracking of a steel pipeline transmitting gas under elevated pressure provided with an external protective coating and means for cathodic protection, and which is in contact with an environment containing at least one material selected from the group consisting of the alkali metal and alkaline earth metal hydroxides, carbonates and nitrates, which comprises: introducing to the environment in contact with said pipeline a composition comprising at least one inhibitor selected from the group consisting of

calcium monobasic phosphate,
sodium monobasic phosphate,
sodium tripolyphosphate, and
potassium silicate;

in an amount sufficient to provide an inhibitor concentration effective to inhibit stress-corrosion cracking of said pipeline.

3,973,057

METHOD OF PREPARING A LIQUID CRYSTAL DISPLAY

Donald Jones Channin, and Eldon Bruce Priestley, both of East Windsor, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 7, 1975, Ser. No. 556,426

Int. Cl.² C09K 3/34; G02F 1/13; B05D 1/18

U.S. Cl. 427—162 4 Claims

1. A method of preparing a liquid crystal cell comprising a layer of difficultly alignable liquid crystal material between two spaced apart siliceous plates which comprises

immersing said plates in a solution containing a silane derivative of the formula R_nSiX_{4-n} wherein R is an organofunctional group which includes an alkyl, X is a hydrolyzable

group attached to the silicon and *n* is an integer of 1–3 and water,

heating said solution while said plates are immersed therein to a temperature between about 75°C. and a temperature just below the boiling point of said solution for at least 3 minutes,

removing excess silane solution from said plates,

drying said plates, and

filling said cell with said liquid crystal material.

3,973,058

METHOD FOR PRINTING INTERLAYERS FOR LAMINATED SAFETY GLASS

John L. Grover, and Wilson H. Power, both of Wilbraham, Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 23, 1974, Ser. No. 535,652

Int. Cl.² B60J *3/00*; B32B *17/10*

U.S. Cl. 427—163 **8 Claims**

1. In the process for printing polyvinyl butyral sheet material used as a component in laminated safety glass said process comprising printing the polyvinyl butyral sheet material with an ink comprising a solvent and at least one dye dissolved in the solvent, the improvement which comprises using an ink having a dye concentration in the range of from 12 to 35% by weight wherein an N-lower alkyl pyrrolidone is used as the major component of the solvent for the ink.

3,973,059

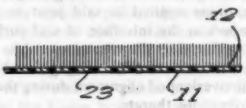
METHOD OF MAKING METAL FLOCKED FABRIC

Perry H. Brown, Norwell; Maurice H. Tremblay, Westboro, and Norman F. Surprenant, Littleton, all of Mass., assignors to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 262,518, June 13, 1972, abandoned, which is a division of Ser. No. 861,787, Sept., 1969, Pat. No. 3,697,238. This application Aug. 16, 1974, Ser. No. 498,097

Int. Cl.² B05D *1/12*, *1/14*, *1/16*

U.S. Cl. 427—180 **2 Claims**



1. A method of forming a flocked metal textile fabric comprising the steps of:

a. providing a porous textile fabric base made from textile metal-forming filaments:

b. flocking composite metal fibers on said base, each composite fiber comprising a plurality of textile metal fibers having rough, unmachined, unburnished outer surfaces, the textile fibers being disposed in a metal matrix material;

c. autogeneously bonding the composite fibers to said base; and

d. removing the matrix material.

3,973,060

PROCESS OF APPLYING NON-ADHESIVE COATINGS TO PLASTICS

Heinz Mueller-Tamm; Oskar Buechner; Volker Gierth, all of Ludwigshafen, and Karl-Heinz Fauth, Frankenthal, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellchaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 257,942, May 30, 1972, abandoned. This application July 1, 1974, Ser. No. 484,435

Claims priority, application Germany, June 3, 1971, 2127416

Int. Cl.² B05D *7/00*

U.S. Cl. 427—222 **7 Claims**

1. A process for coating plastics which tend to agglomerate at ambient temperature selected from the group consisting of copolymers of ethylene which contain more than 20% by weight of polymerized units of a polar ethylenically unsaturated compound, polyisobutylene having a viscosity average molecular weight of from 3×10^5 to 6×10^6 and mixtures of bitumen and ethylene copolymers by applying to them a solution consisting essentially of a nonadhesive resin and a solvent having a temperature of from about 50° to 110°C and evaporating the solvent at a temperature which is lower than the softening point of the plastics to be coated, wherein said nonadhesive resin consists of

1. a copolymer of at least one member of the group consisting of styrene and methylstyrene and a monoester of at least one member of the group consisting of maleic and fumaric acid or

2. a reaction product of at least one member of the group consisting of cyclohexanone and methylcyclohexanone with formaldehyde or acetaldehyde, said nonadhesive resin having a monoscope yield point of more than 80°C and a ball indentation hardness of from 310 to 800 kp/cm² at 10 seconds.

3,973,061

METHOD FOR THE PREPARATION OF POROUS FERROUS METAL IMPREGNATED WITH MAGNESIUM METAL

Jairaj Easwaran, Toledo, Ohio, and George S. Foerster, Hightstown, N.J., assignors to NL Industries, Inc., New York, N.Y.

Division of Ser. No. 454,951, March 26, 1974, Pat. No. 3,902,892, which is a continuation-in-part of Ser. No. 385,584, Aug. 3, 1973, abandoned. This application Mar. 25, 1975, Ser. No. 561,847

Int. Cl.² C23C *1/00*

U.S. Cl. 427—319 **5 Claims**

1. A process for producing porous ferrous metal network impregnated with magnesium which comprises selecting ferrous metal scrap pieces which have a density of 0.1 to 1.0 g/cc, said scrap pieces having lengths from ⅛ to 9 inches, widths from 1/64 to 1 inch and thicknesses from 1 to 100 mils, compacting said pieces using a pressure of from 0.5 to 8.0 tons per square inch to form a metal network having a density from 1.2 to 4.0 g/cc, a porosity of 50 to 85% and a short transverse tensile strength of at least 2 psi, immersing said metal network into a molten bath of magnesium to impregnate said network with said magnesium, the impregnated metal network containing from 18 to 55% by weight of the impregnated network and removing said impregnated network from said molten magnesium.

3,973,062

COATING DEVICE

Fritz Fahrni, Marly, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Oct. 10, 1974, Ser. No. 513,891

Claims priority, application Germany, Oct. 12, 1973, 2351369

Int. Cl.² H01F *10/00*; B05C *5/02*, *9/06*

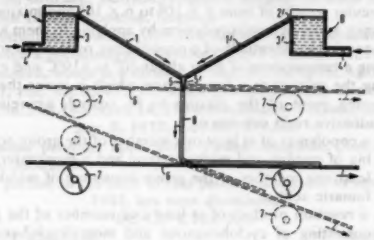
U.S. Cl. 427—420 **18 Claims**

16. A method for the simultaneous application of at least two layers of liquid coating compounds to an article, comprising the steps of:

supplying a layer of liquid to the upper end of a pair of slides that extend downwardly from spaced-apart locations to define a closely-spaced combining slot at their lower ends;

allowing the layers to flow down the slides and through the slot;

combining the layers as they flow through the combining slot; and



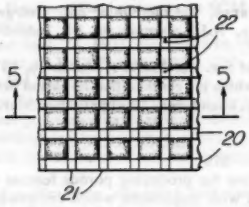
conveying articles to be coated along a path beneath the combining slot.

3,973,063

SPOT BLOCKED THERMOPLASTIC FILM LAMINATE

William Joseph Clayton, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 21, 1974, Ser. No. 525,894
Int. Cl.[2] B32B *3/00*
U.S. Cl. 428—35 7 Claims



1. A laminate of at least two thermoplastic films having a plurality of parallel embossed ribs running in at least one direction, said films being blocked together at spaced apart spots along each rib, whereby said films are joined discontinuously.

3,973,064

ENGAGED BEVELED SHEET FACES ADAPTED TO BE SONICALLY WELDED

Ellis Howard Paine, Woodstock, Conn., assignor to Moldex, Inc., Putnam, Conn.

Continuation of Ser. No. 285,451, Aug. 31, 1972, abandoned, which is a continuation of Ser. No. 57,499, July 27, 1970, abandoned. This application Sept. 6, 1974, Ser. No. 503,627
Int. Cl.[2] B29C *27/08;* B32B *3/06, 31/16;* B23B *31/20*
U.S. Cl. 428—60 5 Claims

1. A joint construction for sonically welding complementary adjacent edge portions of two members of thermoplastic material having edge portions with opposed complementary surfaces inclined with respect to the opposite surfaces of the respective members, said complementary surfaces being adapted to be positioned in overlapping relation and a plurality of ridges upon each of said complementary surfaces extending substantially parallel to the extreme free edge of the edge portion, said ridges being adapted to concentrate sonic vibrations applied to said joint to fuse said members together at the interface of said complementary surfaces and thereby form a substantially flat joint therebetween; a first one of said ridges on each of said members dividing the said complementary surface of that member into substantially equal first and second surface portions, each of said first surface portions extending longitudinally adjacent said free edge of its portion and having the remainder of the ridges of its member, said first ridge on each of said inclined complementary surfaces being adapted to engage each other to maintain alignment of said sheets during welding.

5. In a joint construction for sonically welding complementary associated edge portions of two members of thermoplastic material having opposed generally parallel flat surfaces, each of said members having a free edge adjacent its associated edge portion and a shoulder formed therein adjacent to its opposite edge, said associated edge portions, having opposed complementary surfaces inclined with respect to the opposite parallel surfaces of their respective members and extending between said free edge and said shoulder of the respective member; each of said shoulders extending from one

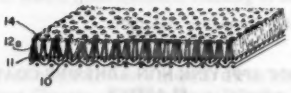
surface of its member towards the other surface thereof a distance substantially equal to the thickness of the free edge of the other member thereby to form a guide abutment for the free edge of the other member; said complementary surfaces being adapted to be positioned in overlapping relation with said free edge of each member mating with said shoulder of the other member; a plurality of ridges upon each of said complementary surfaces extending substantially parallel to said free edge of the edge portion and being adapted to concentrate sonic vibrations applied to said joint to fuse said thermoplastic members at the interface of said surfaces and form a substantially flat joint therebetween while the free edges and shoulders of said members engage each other to hold the members in overlapped alignment during the application of said sonic vibrations thereto.

3,973,065

SYNTHETIC SUEDE

David I. Walsh, Barrington, R.I., and James P. Casey, Seekonk, Mass., assignors to Microfibres, Inc., Pawtucket, R.I.

Continuation of Ser. No. 403,605, Oct. 4, 1973, abandoned. This application Jan. 10, 1975, Ser. No. 540,280
Int. Cl.[2] B05D *1/14, 1/16;* B32B *33/00*
U.S. Cl. 428—89 20 Claims



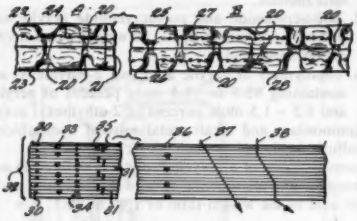
1. Synthetic suede having a leather-like hand comparable to natural suede comprising a flexible substrate having a multiplicity of upstanding flock fibres, adhesive means contacting said fibres and said substrate whereby said fibres are adhered to and extend upright from the substrate, a majority of said fibres having a denier of about ½ to 5, the lengths of said fibres being about 0.005 to 0.075 inch, said flock fibres being crushed in accordance with a predetermined pattern, and an organic acid radical cationic softener substantially uniformly distributed over at least the free end portions of said fibres, said softener being applied to the flock fibers in an amount to

cause at least some of the free ends of said flock fibres to adhere at various points on the surface of the suede.

3,973,066
ELECTRIC BLANKET SHELL AND METHOD OF PRODUCTION

Alexander M. Smith, II; Allen H. Adkins, and Thomas M. Roth, Jr., all of Elkin, N.C., assignors to The Fiberwoven Corporation, Elkin, N.C.

Filed Jan. 16, 1975, Ser. No. 541,645
Int. Cl.² B32B *5/06, 5/08, 5/12, 27/04*
U.S. Cl. 428—91 **30 Claims**



1. An electric blanket shell comprising:
1. first and second needled textile fabrics in juxtaposition to each other and each fabric having textile fibers needled together into an integral, coherent structure;
2. a yarn layer disposed in at least one of the first and second needled fabrics and said yarn layer having a plurality of first planar yarns extending generally in a first planar dimension of the needled fabric;
3. a heat fusible component disposed in at least one of the first and second needled fabric;
4. a plurality of small, discrete fusion bonds spaced from each other which link the first needled fabric to the second needled fabric to form a blanket shell and a series of patterns across a planar dimension of the blanket shell which patterns define a series of channels between the first and second needled fabrics, said patterns of fusion bonds being disposed in a direction traverse to the direction of the said first planar yarns of the yarn layer; and

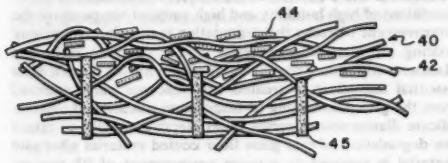
wherein the fusion bonds of any one traversely extending pattern do not engage more than about 50 percent of the said first planar yarns and wherein overlaps of fusion bond patterns are substantially avoided.

28. The shell of claim 1 wherein at least one surface of the blanket shell has a napped surface.

3,973,067
SHORT-FIBERED NONWOVEN FABRICS

Nicholas S. Newman, Cohasset, Mass., assignor to The Kendall Company, Boston, Mass.

Continuation-in-part of Ser. No. 438,189, Jan. 31, 1974, abandoned, which is a division of Ser. No. 206,410, Dec. 9, 1971, Pat. No. 3,816,159, which is a continuation-in-part of Ser. No. 144,607, May 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 831,564, June 9, 1969, abandoned. This application Oct. 18, 1974, Ser. No. 515,879
Int. Cl.² B32B *7/14*
U.S. Cl. 428—195 **6 Claims**



1. An abrasion-resistant nonwoven fabric comprising:
a bonded unspun and unwoven dry-laid fibrous web, substantially free from hydrated and fibrillated fibers;
at least one layer of substantially unbeaten and unhydrated ultra-short cellulosic fibers of between 50 and 300 microns in length adherent to at least one face of said web, said ultra-short fibers being coated with a first acrylic polymeric binder and said fibers in said web being bonded discontinuously along their length with substantial portions of their length being free of bonding agents by a second polymeric binder, said second polymeric binder being a different and firmer acrylic binder than said first binder and having more crosslinkage therein than said first binder.

3,973,068
SOFT, NONWOVEN WEB HAVING HIGH INTENSITY AND LOW INTENSITY BONDS AND A LUBRICANT ON THE SURFACES OF THE SYNTHETIC FILAMENTS COMPRISING SAID

Robert E. Weber, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

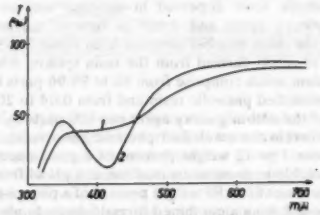
Filed Oct. 28, 1975, Ser. No. 626,252
Int. Cl.² B32B *31/20;* **D04H** *3/14, 3/16*
U.S. Cl. 428—198 **2 Claims**

1. A soft, nonwoven web comprising a sheet of intermingled, thermoplastic filaments having on the surfaces thereof 0.05 to 1.0% of a semi-compatible lubricating agent having a molecular weight in the range of from about 200 to about 4000 and an HLB number in the range of from about 8 to about 20;
said sheet having spaced areas of high bond intensity separated by areas of low bond intensity.

3,973,069
COLORED TRANSPARENT ARTICLES

Emile Plumat, Gilly; Jean Schottey, Montignies-sur-Sambre, and Francois Toussaint, Montignies-le-Tilleul, all of Belgium, assignors to Glaverbel-Mecaniver, Watermael-Boitsfort, Belgium

Division of Ser. No. 455,952, March 28, 1974, Pat. No. 3,905,791. This application Apr. 3, 1975, Ser. No. 564,812
Claims priority, application Luxemburg, Apr. 2, 1973, 67338
Int. Cl.² B32B *7/02, 17/00, 15/04*
U.S. Cl. 428—218 **8 Claims**



1. In a glass body containing, in external layers thereof, at least one metal which influences the color of the body, the improvement wherein: said external layers of glass contain metallic silver and, in an oxidized state, an element having a number of states of oxidation forming at least one redox pair capable of reducing Ag^+ ions; said external layers additionally contain ions of a further metal other than the Ag^+ or said element said ions of a further metal being present in a higher concentration in said external layers than in internal layers of said body wherein said external layers are in a state of compression; and said body has a luminace greater than 70% and an optical characteristic with an absorption peak centered on a wavelength between 405 and 435 mμmid-height and having a width at mi-hetight of not more than 150 mμ resulting in a yellow coloration.

8. A colored glass body formed from a vitrifiable batch and having its color modified by causing a substance to diffuse into surface layers of the glass body from a contacting treatment medium by a process comprising: introducing a reducing agent into the surface of the body; providing a treatment medium composed of at least one salt yielding reducible silver ions capable of being reduced by the reducing agent, and a diluting agent constituted by one or more salts of a metal other than silver; giving the medium an electrical potential at a selected value in the range between − 600 and + 300 mV; contacting the body into which such reducing agent has been introduced with such medium for a predetermined time while maintaining the electrical potential of said medium in such range and while maintaning temperature conditions such that reducible silver ions diffuse from the medium into the body and at least some of such ions are reduced in the body by the reducing agent.

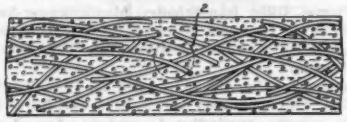
3,973,070
ANTI-MIGRATORY ADDITIVE FOR EMULSIFIED PHENOLIC RESIN SYSTEMS

Woodrow Hayes Ingram, II, Hampden, Mass., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 444,204, Feb. 21, 1974, abandoned, which is a continuation of Ser. No. 323,680, Jan. 15, 1973, Pat. No. 3,932,333, which is a continuation-in-part of Ser. No. 142,905, May 13, 1971, Pat. No. 3,719,616, which is a continuation-in-part of Ser. No. 8,679, Feb. 4, 1970, abandoned. This application July 31, 1975, Ser. No. 600,762

Int. Cl.² B32B *27/08*

U.S. Cl. 428—220 **9 Claims**



1. A sheet member comprising a preformed integral porous substrate of fibrous material ranging in thickness from about 1 to 100 mils saturated with a resin system containing a phenol formaldehyde resin dispersed in aqueous medium and an anti-migratory agent and dried to remove carrier liquids; wherein the sheet member contains from about 3 to 95 weight percent of solids derived from the resin system; wherein the resin system solids comprise from 80 to 99.96 parts by weight of the emulsified phenolic resin and from 0.04 to 20 parts by weight of the anti-migratory agent per 100 parts by weight of solids; wherein the emulsified phenolic resin solids comprise from about 1 to 12 weight percent of a proteinaceous compound soluble in an aqueous medium at a pH of from 7 to 10 and from about 88 to 99 weight percent of a phenol-formaldehyde resole having a combined formaldehyde to phenol mole ratio of from about 0.85 to 3.0, a free formaldehyde content of 1.5 percent maximum, a viscosity in methanol solution at 60 weight percent solids of not greater than about 10,000 centipoises and a water dilutability of from 15 percent to 2000 percent based on resole resin solids, and wherein the anti-migratory agent is selected from the group consisting of:

a. water soluble polyelectrolytes selected from the group consisting of:
   1. polyacrylic acid and copolymers of acrylic acid and vinyl acetate containing up to 50 mole percent of vinyl acetate and the ammonium and alkali metal salts thereof,
   2. polymethacrylic acid and copolymers of methacrylic acid and vinyl acetate containing up to 50 mole percent of vinyl acetate and the ammonium and alkali metal salts thereof,
   3. copolymers of maleic anhydride and a comonomer selected from the group consisting of ethylene, propylene, butylene, styrene, chlorostyrene, vinyl toluene, vinyl formate, vinyl acetate, vinyl propionate, and vinyl benzoate and the ammonium and alkali metal salts thereof,
   4. copolymers of a monoalkyl maleate wherein the alkyl group is methyl, ethyl, propyl, or butyl and a comonomer selected from the group consisting of ethylene, propylene, butylene, styrene, chlorostyrene, vinyl toluene, vinyl formate, vinyl acetate, vinyl propionate, and vinyl benzoate and the ammonium and alkali metal salts thereof,
   5. polyacrylamide and polyacrylamide acrylic acid copolymer containing up to 10 weight percent of acrylamide units, and
   6. copolymers of acrylic acid and 2-ethylhexyl acrylate containing 93.5 to 98.5 mole percent of acrylic acid and 6.5 – 1.5 mole percent of 2-ethylhexyl acrylate;
b. ammonium and alkali metal salts of hydrochloric and sulfuric acid, and
c. combinations of a polyelectrolyte as defined in and ammonium and alkali metal salts of hydrochloric and sulfuric acid in the weight ratio of 1:99 to 99:1.

3,973,071
GLASS FIBER MATERIAL HAVING STRENGTH RETENTION IN A MOIST ENVIRONMENT

Dennis M. Fahey, Aspinwall, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 461,683, April 17, 1974, abandoned. This application Sept. 22, 1975, Ser. No. 615,267

Int. Cl.² C04B *31/24*; C09C *1/02*, *1/28*; B32B *17/04*

U.S. Cl. 428—292 **7 Claims**

1. In a glass fiber bundle suitable for reinforcing a host elastomeric material comprising: a bundle of sized glass fibers having disposed about and throughout the bundle a coating composition containing a phenolic resin and an elastomer selected from the group consisting of styrene-butadiene-vinyl-pyridine terpolymers and styrene butadiene copolymers as essential ingredients, the improvement comprising: said coating composition having therein a treated diatomaceous earth selected from the group consisting of magnesium silicate and calcium silicate diatomaceous earths in an amount effective to provide for substantially retained tensile strength of the glass fiber bundle after exposure to a moist environment of 95 percent relative humidity and about 100% F. for a period of at least 8 days, and wherein said coated glass fiber bundle contains no 2,6-ditert-butyl-4-phenylphenol therein.

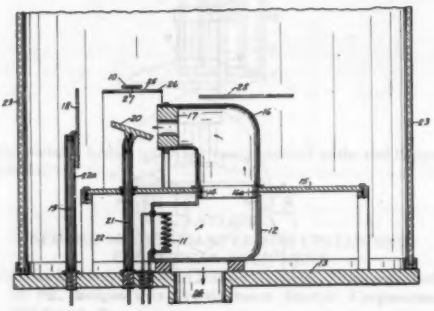
7. In the preparation of phenolic resin and elastomer coated glass fiber materials for rubber reinforecement, wherein said elastomer is selected from the group consisting of styrene-butadiene-vinyl pyridine terpolymers and styrene-butadiene copolymers, wherein said coated glass fiber material contains no 2,6-ditert-butyl-4-phenyl-phenol therein and further, wherein the coated materials are subject to degradation under conditions of high humidity and high ambient temperature the improvement whereby the degradation is retarded comprising coating the glass fiber material with a phenolic resin and elastomer containing coating composition having therein as an essential ingredient, a treated diatomaceous earth selected from the group consisting of magnesium silicate and calcium silicate diatomaceous earths in an efective amount to retard the degradation of said glass fiber coated material after said material is exposed to a moist environment of 95 percent relative humidity at about 100°F. for a period of at least 8 days.

3,973,072

MAGNETIC RECORDING MEDIUM HAVING BINDER-FREE PHOSPHIDE COATING

Gerald S. Anderson, Roseville; John D. Holm, Lake Elmo; Richard L. Jacobson, St. Paul, and Ronald E. Smith, Robbinsdale, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 20, 1973, Ser. No. 333,877
Int. Cl.² H01F *10/02*
U.S. Cl. 428—336 **9 Claims**



1. Magnetic recording medium comprising:
a backing member of low permeability comprising
nonmagnetic metal,
glass or
a polymer which has good high temperature properties and
a binder-free thin film coating about 50 A to 5 micrometers in thickness and of approximately M_3P wherein
P is primarily phosphorus and
M consists essentially of a combination of at least two transition metals,
providing a Curie temperature of 50°–350°C, a B_r of at least 1500 gauss and an H_c of at least 500 oersteds.

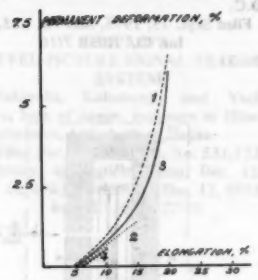
3,973,073

BICOMPONENT POLYESTER FILAMENTS AND PROCESS FOR MAKING SAME

Gérard Barbe, St. Didier; Robert Habault, Lyon, and Jean-Louis Tamet, Besancon, all of France, assignors to Rhone-Poulenc-Textile, Paris, France

Continuation of Ser. No. 356,476, May 2, 1973, abandoned. This application Mar. 18, 1975, Ser. No. 559,421
Claims priority, application France, May 4, 1972, 72.16921
Int. Cl.² B32B *15/00*; D02G *3/00*
U.S. Cl. 428—370 **7 Claims**

1. Helically crimped bicomponent polyester filaments of improved elasticity and substantially permanent crimping, said filaments comprising at least 20% by weight of two different, substantially unmixed components in a side-by-side assembly along the length of said filaments, one component being polyethylene terephthalate and the other component being sparingly crosslinked polybutylene terephthalate having at least 0.20 mole percent of crosslinking agent, based on the terephthalic acid content of the polybutylene terephthalate,



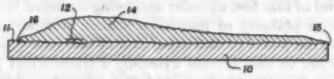
wherein the sparingly crosslinked polybutylene terephthalate has a viscosity value IV of about 1000 of about 1500.

3,973,074

FLAME-PROOF CELLULOSIC PRODUCT

Richard C. F. de Lissa, White Rock, and Walter G. Schwarze, Burnaby, both of Canada, assignors to MacMillan Bloedel Limited, Vancouver, Canada

Continuation of Ser. No. 334,105, Feb. 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 146,089, May 24, 1971, abandoned. This application Mar. 19, 1975, Ser. No. 559,767
Int. Cl.² B32B *21/00*, *21/04*
U.S. Cl. 428—537 **3 Claims**



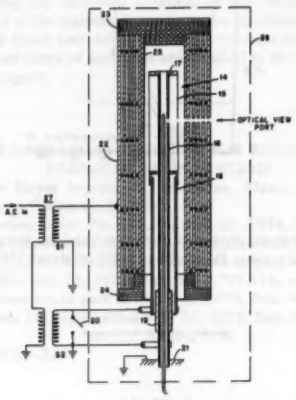
1. A flame-proof product comprising a cellulosic or wood base substrate having at its surface at least one fire retardant chemical compound selected from the group consisting of potassium hydroxide and potassium carbonate, said compound being provided at said surface in an amount of at least 75% by weight based on the total weight of fire retardant chemicals applied to said surface by drying a solution of said compound applied thereto, the amount of said compound at said surface being sufficient such that when said surface is subjected to high temperatures, said surfaces foams with decomposing cellulosic material to form a layer of relatively noncombustible intumescent carboniferous char.

3,973,075

HIGH TEMPERATURE FURNACE

Casimer J. Borkowski, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 15, 1975, Ser. No. 613,705
Int. Cl.[2] H05B 7/16
U.S. Cl. 13—31 4 Claims



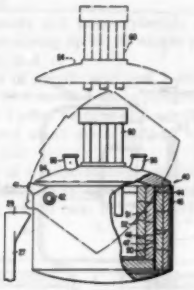
1. A high temperature furnace for operation in a vacuum comprising a first elongated metallic cylinder, an elongated thin metallic cylindrical filament having one end thereof slipped over one end of said cylinder and affixed thereto, a second elongated metallic cylinder, a base support, said second cylinder provided with a metal washer affixed to one end thereof, said washer fitting within the other end of said cylindrical filament and affixed thereto, said second cylinder extending completely through said filament and beyond the other end of said first cylinder and being mounted in said base support, a plurality of insulation spacer members mounted between the inside of said other end of said first cylinder and the outside of said second cylinder, a transformer provided with two primary windings and two secondary windings, a metallic thermal radiation shield encompassing a major portion of said elongated first cylinder and its attached filament and defining an air space therebetween, one of said transformer secondary windings being connected between said radiation shield and ground, the other one of said transformer secondary windings connected to said filament through said first cylinder and to ground with said second cylinder also connected to ground to complete a circuit through said filament, a shorting switch connected across said other one of said secondary windings, and a vacuum enclosure enclosing said base support, said filaments, said first and second cylinders, and said thermal radiation shield, whereby when said transformer is energized and said shorting switch is open, said filament is directly heated until it emits electrons by thermionic emission and when the inside wall of said radiation shield is heated up and also begins to emit electrons by thermionic emission then said shorting switch is adapted to be manually closed such that the cloud of electrons that then exist between said filament and the inside wall of said shield begins an alternating electron bombardment of the filament and said wall by means of said one secondary winding to thus keep both said filament and said shield wall hot.

3,973,076

FURNACE FOR MELTING HIGHLY CORROSIVE SLAG

William W. Scott, Jr., Parkesburg, and Charles D. Guth, Coatesville, both of Pa., assignors to Lukens Steel Company, Coatesville, Pa.

Continuation-in-part of Ser. No. 367,941, June 7, 1973, Pat. No. 3,905,804. This application Nov. 27, 1974, Ser. No. 527,842
Int. Cl.[2] F27D 1/04
U.S. Cl. 13—35 18 Claims



1. A furnace for slag containing at least ten percent calcium fluoride which comprises a first inner liner composed of carbon, a second liner surrounding first liner and in continuous juxtaposition therewith also composed of carbon and a third liner of refractory brick surrounding said second liner, said first liner having at least one horizontal interstice below the normal slag level of the furnace, said second liner being without any horizontal interstice at the same level as said firstmentioned horizontal interstice, a material which provides for the expansion comprising a layer between said second and third layers, a fourth liner of refractory bricks surrounding and in continuous juxtaposition with said third liner, a layer of insulation provided around said fourth liner and a steel shell provided for the furnace surrounding said liners and said expansion layer, said liners and said layer being cylindrical in shape, a roof being included in the furnace which is comprised of heat-insulating material, an opening in the central area of said roof adapted to receive an electrode for heating slag in the furnace, a spout provided in the upper part of the furnace for the discharge of slag from the furnace.

3,973,077

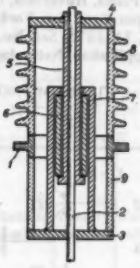
BUSHING FOR ELECTRICAL CONNECTION

Åke Classon, Ludvika, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Nov. 7, 1975, Ser. No. 629,790
Claims priority, application Sweden, Nov. 19, 1974, 7414502
Int. Cl.[2] H01B 17/26
U.S. Cl. 174—15 BH 7 Claims

1. Bushing for leading an electrical connector through a wall or the like, comprising an intermediate flange (1) for attachment in the wall, two metallic end flanges (3, 4) arranged on either side of the intermediate flange and two hollow insulating bodies (8, 9) clamped between the intermediate flange and the end flanges, and a bushing conductor (2, 22, 10) running the length of the whole bushing, said bushing conductor being movable in relation to at least one of the end flanges (3, 4), and a drawing member connected between the end flanges comprising a first (7) and a second (5) elongated metallic body, each of which is attached at one end to a corresponding end flange (3, 4), said bodies overlapping each other

for a certain distance, and a pressure-transmitting member forming a power-transmitting connection between the ends of



the metallic bodies which are not connected to the end flanges (3, 4).

3,973,078

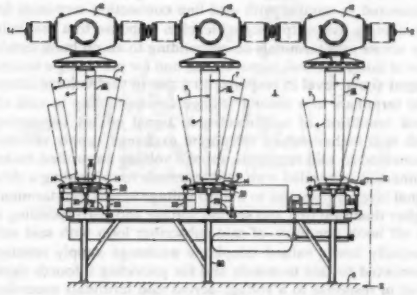
SEISMIC MOTION-DAMPER FOR UPSTANDING ELECTRICAL EQUIPMENT

Charles B. Wolf, Irwin, and Donald G. Blazer, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 30, 1974, Ser. No. 537,515

Int. Cl.² F16F *15/00;* **H02B** *5/00;* **E02D** *27/34;* **F16F** *9/19*

U.S. Cl. 174—42 **5 Claims**



1. A support system for upstanding electrical apparatus having a tall, slender profile that is capable of protecting the upstanding electrical apparatus against severe earthquake forces, comprising, in combination:

a. means defining upstanding electrical equipment including at least one upstanding insulating column structure;

b. means defining a lower-disposed main metallic supporting framework structure (20) in contact with the ground and responsive to the earthquake motion thereof;

c. means defining a hollow metallic column base (63) in general vertical alignment with said upstanding insulating column structure for rigidly supporting said one upstanding insulating column structure with the former being fixedly secured to said lower-disposed main metallic supporting framework structure (20);

d. means including a metallic base-supporting plate structure (10) fixedly secured to the lower end of said upstanding insulating column structure for fixedly securing said one upstanding insulating column structure to said hollow metallic column base (63) in vertical superimposed relationship;

e. at least a pair of spaced metallic radially-outwardly-extending outrigger arms (14) fixedly secured to said metallic base-supporting plate structure (10); and,

f. means defining a dashpot assembly (25) interposed between the outer end of each of said pair of metallic outrigger arms (14) and said lower-disposed main metallic supporting framework structure (20) for dissipating the kinetic energy of possible swaying movement of the upstanding insulating column structure in response to earthquake stimulation.

3,973,079

TWO-LEVEL PICTURE SIGNAL TRANSMISSION SYSTEM

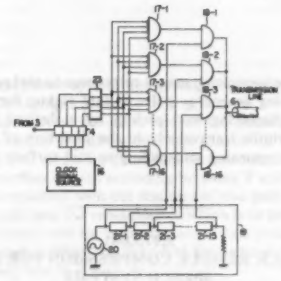
Takahiko Fukinuki, Kokubunji, and Yoshizumi Eto, Sagamihara, both of Japan, assignors to Hitachi, Ltd. and Hitachi Electronics, Ltd., both of, Japan

Filed Dec. 9, 1974, Ser. No. 531,173

Claims priority, application Japan, Dec. 12, 1973, 48-137728; Dec. 12, 1973, 48-137729; Dec. 12, 1973, 48-137730

Int. Cl.² H04L *27/20*

U.S. Cl. 178—6 **8 Claims**



1. A two-level picture signal transmission system comprising a means for obtaining two-level picture signal by scanning an original picture; a means for dividing said two-level picture signal into blocks each consisting of a predetermined number of picture elements and for converting the picture elements contained in said blocks to a corresponding code; a level, frequency or phase modulating circuit for performing modulation in accordance with said code; a means for transmitting the output of said modulating circuit; a demodulator for demodulating the signal received through said transmitting means into the corresponding codes; and an apparatus for reproducing the image of said original picture from the output signal of said demodulator, wherein said modulation circuit converts those codes which cause the continuous shift of the contour of picture, to the corresponding transmission signals having adjacent level, frequencies or phases.

3,973,080

PLAYBACK DEVICE FOR A DISC-SHAPED RECORD CARRIER WITH TRANSDUCER LIFTING FOR CHANGING PLAYBACK GROOVE FOR FAST, SLOW OR STOP EFFECTS

Gerhard Dickopp; Benno Jahnel; Wolfgang Rainer, and Paul Ludwig Dümmen, all of Berlin, Germany, assignors to TED Bildplatten Aktiengesellschaft, AEG-Telefunken, TELDEC, Zug, Switzerland

Filed Apr. 11, 1974, Ser. No. 460,164

Claims priority, application Germany, Apr. 11, 1973, 2318871

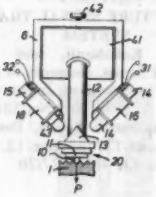
Int. Cl.² H04N *5/76;* **G11B** *3/36, 17/06*

U.S. Cl. 178—6.6 R **13 Claims**

1. In a playback device for a disc-shaped record carrier containing signals stored in the grooves thereof, said device including means for rotating the record carrier, a movable carriage, means for moving said carriage in a direction radially to the record during playback, a pickup having a stylus arranged to contact one surface of the record carrier and engage

in a groove thereof, and a mount which is connected to said carriage, for elastically supporting said pickup, the improvement comprising:

means for providing power pulses at desired times during playback; and



energy pulse generating means responsive to said power pulses for applying an energy pulse to said pickup for lifting said pickup, displacing said pickup by a desired number of groove widths transversely to the direction of the groove and then returning said pickup to said surface of said carrier.

3,973,081

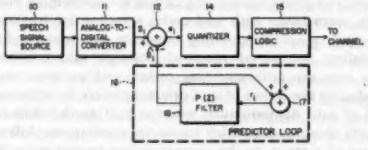
FEEDBACK RESIDUE COMPRESSION FOR DIGITAL SPEECH SYSTEMS

Sandra E. Hutchins, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Sept. 12, 1975, Ser. No. 612,992

Int. Cl.² G10L 1/06

U.S. Cl. 179—1 SA **6 Claims**



1. A digital speech compression system comprising:

a. a digital source of speech;

b. a first digital adder;

c. a quantizer;

d. a compression logic, said source having its output connected to said first adder, and said quantizer and compression logic being connected in cascade to an output of said first adder, the output of said compression logic being the compressed digital speech; and

e. a predictor loop connected between said compression logic and a negative input of said first adder, said predictor loop including;

f. a second digital adder; and

g. a digital predictive filter, said compression logic being coupled to an input of said adder which in turn is connected to said filter and to the negative input of said first adder, the output of said filter being further connected to another input of said second adder, whereby the residue stream of digital data is estimated inside said predictor loop.

3,973,082

ELECTRONIC TELEPHONE SUBSCRIBER SET WITH VOLTAGE CONTROLLED VARIABLE SHUNT

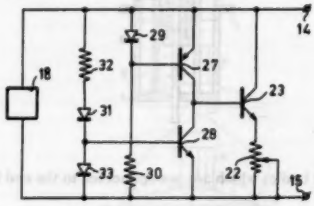
Petrie Johan van der Plaats, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 11, 1975, Ser. No. 548,997

Claims priority, application Netherlands, Feb. 26, 1974, 7402575

Int. Cl.² H04M 1/00

U.S. Cl. 179—81 R **3 Claims**



1. A telephone subscriber set which is suitable for cooperating with a telephone exchange incorporating supply resistors, the values of which are substantially higher during the detection of on hook/off hook conditions of a subscriber loop and substantially lower during speech conditions, comprising a pair of line connection terminals connected to said telephone exchange supply resistors, an electronic signal circuit means coupled to said terminals for providing audio frequency signals and for providing on hook/off hook resistances across said terminals, first voltage controlled means connected in parallel with said line connection terminals for providing a first output signal level in response to a first voltage across said terminals corresponding to an on hook condition of said electronic signal circuit and for providing a second output signal level in response to a rise in said voltage across said terminals to a second voltage corresponding to said off hook condition of said electronic signal circuit concurring with said higher valued telephone exchange supply resistors connected to said terminals, second voltage controlled means connected in parallel with said terminals for providing a third signal level in response to a third voltage across said terminals higher than said first and second voltage and corresponding to an off hook condition of said subscriber loop with said substantially lower valued telephone exchange supply resistors connected to said terminals and for providing a fourth signal level in response to a voltage across said terminals exceeding said third voltage, and signal controlled resistor means connected in parallel with said terminals and connected to said first and second voltage controlled means for providing a first high resistance across said terminals in response to a concurrence of said first and said third signal levels and for providing a resistance across said terminals substantially lower than said first resistance in response to a concurrence of said second and third signal levels and for providing a third resistance across said terminals substantially higher than said second resistance in response to a concurrence of said second and fourth signal levels.

3,973,083

ROTARY DIAL DEVICE FOR A TELEPHONE SET

Koichi Sekiguchi, Asaka, Japan, assignor to Iwasaki Tsushinki Kabushiki Kaisha, Japan

Filed Jan. 30, 1974, Ser. No. 437,784

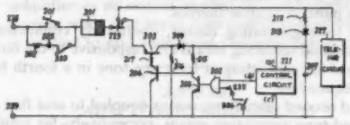
Claims priority, application Japan, Jan. 31, 1973, 48-11913; Feb. 27, 1973, 48-22688

Int. Cl.² H04M 1/66

U.S. Cl. 179—90 D **4 Claims**

1. In a DC pulse rotary dial device for a telephone set of the type having a rotary dial; a plurality of cams mounted for rotation with said dial; and a plurality of contacts cooperative

with said cams to open and close upon rotation of said cams; the improvement which comprises: a contact; and a cam cooperative with said contact and having a profile effective to



change the contact state to classify dialed digits into one of three groups respectively comprised of the digits "0," "1," and "2" through "9."

3,973,084

ELECTRIC IMPULSE TRANSMITTERS FOR TELEPHONE INSTRUMENTS

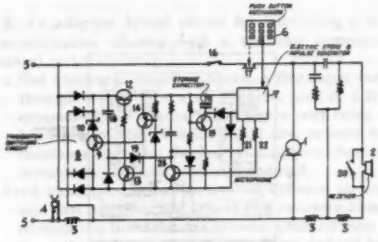
Per Jorgen Hovland, 72 Aln St., County Durham, Hebburn, England

Filed Jan. 14, 1975, Ser. No. 540,885

Claims priority, application United Kingdom, Jan. 15, 1974, 1800/74

Int. Cl.² H04M 1/44

U.S. Cl. 179—90 K **4 Claims**



1. An electric impulse transmitter for a telephone instrument comprising:

A. electric storage means for storing digit values of a telephone number to be signalled over a telephone line associated with the instrument,

I. the digit values being signalled by alternately making and breaking within the telephone instrument of a loop circuit including said telephone line,

B. an electric impulse generator for generating trains of impulses in respect of said digit values,

C. transistor switching means

I. the major current path of which is arranged to be connected in said loop circuit

a. to effect said making and breaking of said loop circuit in dependence upon output signals from said impulse generator, and

D. electric circuit means

I. connected in parallel with the major current path of said transistor switching means

II. to derive energizing current for at least the electric storage means

a. from an exchange source by way of said telephone line

b. during loop-make periods.

3,973,085

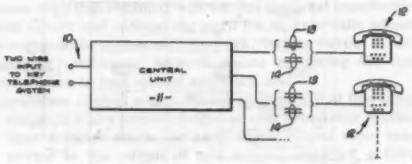
KEY TELEPHONE SYSTEM WITH DIRECTLY ASSOCIATED STATION CARDS AND SETS

Milo B. Shiff, Anaheim, Calif., assignor to The Anaconda Company, New York, N.Y.

Filed Sept. 26, 1974, Ser. No. 509,398

Int. Cl.² H04Q 5/18

U.S. Cl. 179—99 **8 Claims**



1. In a telephone system comprising a plurality of station sets, each including a plurality of key buttons,

a. a station circuit for each one of the station sets, each station circuit including interface means for transferring data to and receiving data from its associated station set, said interface means including between 2 and 3 pairs of wires connected with the station set, one pair of which is a talk pair, and the remainder of which is or are for power transmission and for transmission of data related to line, status and audible signaling and for control information including switch status, and

b. a line circuit for at least one line, each line circuit including means for transmitting control, status and talk information to, and receiving control, status and talk information from, at least one station circuit connected therewith, the line circuit including line logic means to transmit to a station circuit interface means information corresponding to holding or ringing signals, for visual display and audible signaling at the station sets,

c. said station circuit including a data multiplexer and encoder for receiving ringing and hold signals transmitted from at least one line logic means, and for converting said signals into composite digital data which is pulse width encoded and modulated, for transmission to said interface means,

d. said interface means comprising a common full duplex transmission junction to which said encoder is operatively connected and to which said composite data is supplied in modulated form, there being a DC power source connected to said junction and said junction connected to said station sets via a remaining wire pair, and

e. each station set including circuitry comprising a demodulator to receive and demodulate the modulated composite data, a data separator connected with the output of the demodulator to separate information data from clock data, decoder means responsive to the data separator output to drive station key lights and an audible ringer, the decoder means also driving line select HOLD and HOOK switches to produce corresponding return control data, and the station set including a modulator operatively connected with the data separator to receive return clock data, and with said switches to receive switch status data, the modulator output also connected with said remaining wire pair to transmit return data thereon and to said junction, in full duplex relation, whereby only one system clock is required,

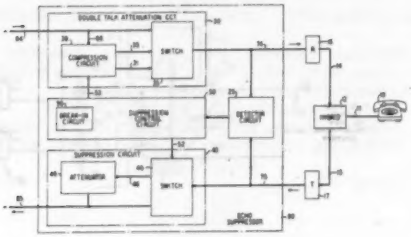
f. the station circuit including circuitry connected with said junction to receive said return data, and responsive to a HOLD command in the return data to transmit a HOLD signal to the line circuit.

3,973,086

DIGITAL ECHO SUPPRESSOR BREAK-IN CIRCUITRY

Carl Jerome May, Jr., Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 24, 1975, Ser. No. 571,056
Int. Cl.² H04B 3/20
U.S. Cl. 179—170.2 11 Claims



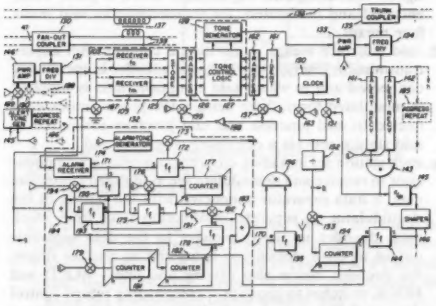
1. In a digital arrangement for suppressing echoes in a two-way communications system having incoming and outgoing paths; means responsive to incoming communications signals for inserting a suppression loss in said outgoing path; and break-in means responsive to outgoing communications signals for removing said suppression loss and for inserting a compression loss in said incoming path; said compression loss inserting means comprising means for detecting when said incoming signals equal or exceed a selected value, means for modifying said incoming signals to generate compressed signals, and means responsive to said detecting means for blocking said incoming signals when said incoming signals equal or exceed said selected value and for extending said compressed signals to said incoming path.

3,973,087

SIGNAL REPEATER FOR POWER LINE ACCESS DATA SYSTEM

Kouan Fong, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 5, 1974, Ser. No. 529,999
Int. Cl.² H04B 3/58, 3/38
U.S. Cl. 179—170 R 16 Claims



1. A repeater for relaying information in a two-way communication system utilizing a power line distribution network as the communication medium, said repeater comprising:

coupling means for coupling said repeater to the power lines at positions adjacent a power distribution node;

first receiving means for receiving a signal in a first band of frequencies from a first direction and producing a pulse indicative thereof;

timing means coupled to said first receiving means for controlling the operation of said repeater and starting said operation in response to said pulse;

first tone generating means, operatively connected to said first receiving means and responsive to said pulse, for generating at least one tone in a second band of frequencies;

second receiving means, for receiving a signal in a thrid band of frequencies from a second direction and producing a pulse indicative thereof;

second tone generating means, operatively connected to said second receiving means and responsive to the output thereof for generating at least one tone in a fourth band of frequencies;

first and second amplifying means coupled to said first and second tone generating means, respectively, for amplifying the outputs thereof; and

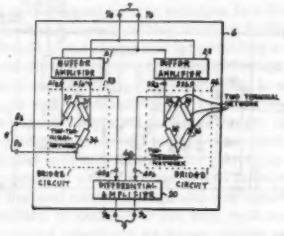
frequency dividing means connected to the inputs of said first and second receiving means and to the outputs of said first and second amplifying means for isolating the signals from and to said first and second amplifying means and said first and second receiving means, respectively, and connecting said first and second amplifying and said first and second receiving means to said coupling means.

3,973,088

WIDE-BAND HYBRID NETWORK

Chuichi Ota, Tokyo, and Yotaro Yatsuzuka, Yokohama, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Nov. 26, 1974, Ser. No. 527,378
Claims priority, application Japan, Nov. 28, 1973, 48-132615
Int. Cl.² H04B 1/58
U.S. Cl. 179—170 NC 6 Claims



1. A wide-band hybrid network, comprising:

a first buffer amplifier receiving an input from a first four-wire section;

a second buffer amplifier connected in parallel with said first buffer amplifier to receive the same input from the first four-wire section;

a differential amplifier having a pair of inputs and having an output for connection to a second four-wire section;

a main bridge circuit having a first pair of terminals connected to a wide-band two-wire transmission line, a second pair of terminals receiving an output of said first buffer amplifier, and a third pair of terminals for deriving therefrom an output connected across one input of said differential amplifier and ground; and

an auxiliary bridge circuit having a structure corresponding to the structure of said main bridge circuit, including a pair of input terminals for receiving the output of said second buffer amplifier and which correspond to the second pair of terminals of said main bridge circuit, a pair of output terminals for applying an output across the other input of said differential amplifier and ground and which correspond to the third pair of terminals of said main bridge circuit, and a first two-terminal impedance network having an impedance substantially equivalent to the impedance of the wide-band two-wire transmission line and which is connected within said auxiliary bridge

circuit across nodes corresponding to the first pair of terminals of said main bridge circuit to which the wide-band two-wire transmission line is connected;

whereby the input from the wide-band two-wire transmission line is transmitted to the output of the differential amplifier as an output applied to said second four-wire section while said input from said first four-wire section is applied to said wide-band two-wire transmission line.

3,973,089

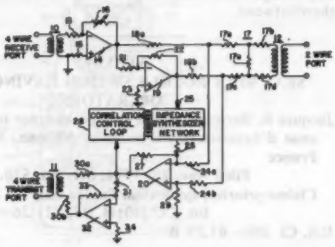
ADAPTIVE HYBRID CIRCUIT

Charles McD. Puckette, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 410,474, Oct. 29, 1973, abandoned. This application June 25, 1975, Ser. No. 590,379

Int. Cl.² H04B *1/58*

U.S. Cl. 179—170 NC **24 Claims**



5. An adaptive hybrid circuit for interfacing a four-wire communication channel with a two-wire communication channel and comprising:

a first electronic amplifier having a first input connected through a first resistor to a receive port of a four-wire communication channel, the receive port being defined by a first pair of terminals, said first resistor having a resistance such that the four-wire receive channel is terminated in its characteristic impedance;

fixed impedance means connected between an output of said first amplifier and a port of a two-wire channel for termination thereof in its nominal characteristic impedance, the two-wire channel port being defined by a second pair of terminals;

a second electronic amplifier having a first polarity input terminal to which is applied a first signal which represents a sample of the signal received from the four-wire receive channel, said second amplifier having a second amplifier having a second polarity input terminal to which is applied a fixed reference potential, a selected one of the first and second polarity input terminals connected to said fixed impedance means for applying to the selected polarity input terminal a second signal sensed at said fixed impedance means when said four-wire receive channel is activated and for applying only to the selected polarity input terminal a signal supplied to the two-wire channel port from the two-wire channel when said two-wire channel is activated, the selection of the polarity input terminal of said second amplifier being determined by the phase relationships of the first and second signals at inputs to the amplifier terminals in order to obtain cancellation therebetween at said second amplifier, said second amplifier having an output connected through a second resistor to a transmit port of the four-wire channel, the transmit port being defined by a third pair of terminals, said second resistor having a resistance such that the four-wire transmit channel is terminated in its characteristic impedance, said second amplifier providing a nulling of the first and second signals applied to the input terminals thereof when said four-wire receive channel is activated so as to isolate the four-wire transmit port from the four-wire receive port independent of variation in the impedance characteristics of the two-wire channel due to signal loss in said fixed impedance means swamping out such impedance variations;

impedance synthesizer network means having a first input connected to the output of said first amplifier and a first output connected to a selected one of said first and second polarity input terminals of said second amplifier for providing a high degree of precision of the nulling at the output of said second amplifier so as to obtain improved isolation between the four-wire receive and transmit ports in the order of 12 dB or more over that obtained with the conventional transformer hybrid circuit and without the need for an externally adjustable compromise termination network, the first output of said impedance synthesizer network means producing the first signal applied to said second amplifier; and

correlation control means having an input signal first input connected to a second output of said impedance synthesizer network means, an error signal second input connected to the output of said second amplifier, a third input connected to a third output of said impedance synthesizer network means, and an output connected to a second input of said impedance synthesizer network means for adaptively controlling the operation thereof so that the high degree of precision of the null at the output of said second amplifier is maintained throughout the operation of the adaptive hybrid circuit.

3,973,090

TELEPHONE NUMBER ASSIGNMENT RECORD VERIFICATION APPARATUS AND METHOD

Arthur O. Miller, Dallas, Tex., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 389,011, Aug. 16, 1973, Pat. No. 3,891,811. This application Apr. 3, 1975, Ser. No. 564,927

Int. Cl.² H04B *3/46*

U.S. Cl. 179—175.3 A **9 Claims**

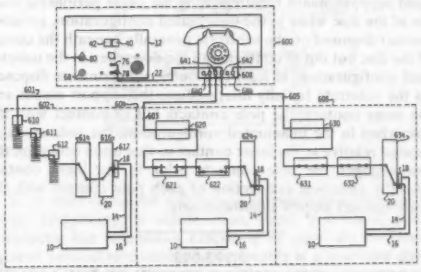


FIGURE 1

1. An apparatus for identifying one of a plurality of groups of wires connected to a switching network which selects one of the wire groups in response to a code received over another of the wire groups and electrically connects the selected wire group to the other wire group, the apparatus comprising:

code generating means for connection to a first of the wire groups for generating a code to cause the switching network to connect the first wire group to a second of the wire groups;

field means connected to the code generating means for transmitting an interrogate signal and receiving an identifying signal identifying the second wire group; and

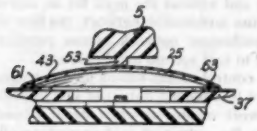
control means for connection to a selected number of the plurality of wire groups including the second wire group for generating the identifying signal in response to receipt of the interrogate signal.

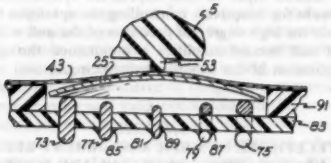
3,973,091

PUSHBUTTON KEYBOARD ASSEMBLY HAVING POLE AND INNER CONTACTS SIMULTANEOUSLY ENGAGED BY A BRIDGING CONTACT

Perry W. Kaminski, Norton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 3, 1975, Ser. No. 546,466
Int. Cl.² H01H 13/70, 1/06
U.S. Cl. 200—5 A 11 Claims





1. A keyboard system comprising a generally flat substrate, a plurality of switching stations provided on the substrate, each switching station comprising an electrically conductive disc, the disc having an unactuated and an actuated configuration and having an outer peripheral margin, electrically isolated support means for supporting the outer peripheral margin of the disc when in the unactuated configuration, an inner contact disposed on the substrate generally beneath the center of the disc but out of contact with the disc when in the unactuated configuration, at least two outer pole contacts disposed on the substrate radially intermediate the support means and the inner contact, the pole contacts out of contact with the disc when in the unactuated configuration, the pole contacts located relative to the inner contact so that upon actuation the disc engages the pole contacts prior to the inner contact whereby electrical connection of each pole contact with the inner contact occurs simultaneously.

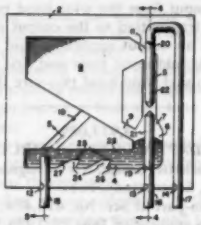
3,973,092

ACCELERATION SENSING SWITCH OF THE LIQUID CONTACT TYPE HAVING TIME DELAY STRUCTURE

David S. Breed, Boonton; Harald S. Husby, Budd Lake, and Stanley Sung, Boonton Township, all of N.J., assignors to Breed Corporation, Fairfield, N.J.

Filed Mar. 22, 1974, Ser. No. 453,992
Int. Cl.² H01H 35/14, 29/08
U.S. Cl. 200—61.47 10 Claims

1. An acceleration sensing device comprising a casing having therein a pair of substantially normal passages forming substantially a right angle to one another and confronting one another at their adjacent ends; a first electrical conductor in one of said passages at one end of the latter; a second electrical conductor in the other of said passage confronting but spaced from said one electrical conductor; a quantity of electrically conductive liquid occupying said one of said passages and engaging said first conductor; and liquid passageway means establishing communication between said passages at said right angle, whereby acceleration of said casing in one direction enables a sufficient quantity of said liquid to flow from said one of said passages into the other of said passages



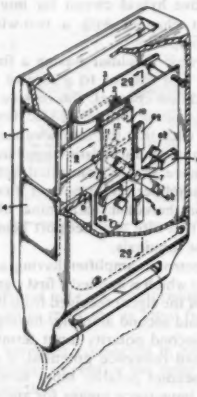
and bridge said conductors to establish a conductive path therebetween.

3,973,093

SEAT BELT BUCKLE SWITCH HAVING PLURAL OPERATORS

Jacques R. Bertrand, Paris, France, assignor to Societe Parisienne d'Accessoires Automobiles Klippan, S.A.R.L., Paris, France

Filed Nov. 25, 1974, Ser. No. 526,561
Claims priority, application France, Mar. 7, 1974, 74.23126
Int. Cl.² H01H 3/32, 21/36
U.S. Cl. 200—61.58 B 9 Claims



1. Safety belt buckle which includes a control device for opening and closing a circuit for an energizing device, wherein said device comprises a first control member arranged in the buckle so as to bring about the opening of the circuit if it is closed and to be without effect if the circuit is open, a second control member arranged in the buckle so as to open the circuit if it is closed and to close it if it is open, a shaft mounted in the buckle, a rotary element borne by the shaft with long and short arms on said element, the long arms operatively engageable by the two control members, the short arms operatively engageable by the second control member, a first pinion the rotation of which is controlled by the first control member, and a second pinion the rotation of which is controlled by the second control member, the two pinions gearing with one another, and controlling the position of at least one turning contact, opening and closing the circuit depending on the position of the pinions.

2. Device according to claim 1 wherein the control members contain bars the ends of which work together with the arms of the rotary element in order to make it turn.

3. Device according to claim 2 wherein the short arms include a contact cooperating with a fixed contact.

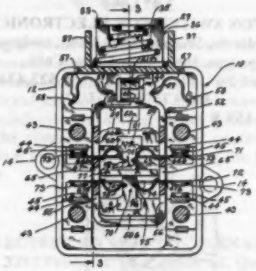
4. Device according to claim 3, said shaft bearing a part carrying contacts corresponding to the short arms of the rotary elements and engaging fixed contacts.

3,973,094

TWO-STAGE SNAP-ACTION SWITCH

Edward H. Kuhn, Milwaukee, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Apr. 28, 1975, Ser. No. 572,539
Int. Cl.² H01H *13/28*
U.S. Cl. 200—67 PK **8 Claims**



1. In a snap-action mechanism for an electrical switch including a reciprocally operated movable contact member operated by an overcenter spring means that has one end that acts upon the movable contact member and urges said contact member toward one of two positions depending upon which side of center said spring means resides, the combination therewith of:

a housing for said movable contact member and said overcenter spring means, and comprising stationary toggle mechanism support means and stationary operator guide means;

a movable actuator that reciprocates in a stroke between two positions;

means for biasing said actuator toward one of said positions;

a reciprocally movable operator in said housing guided by said operator guide means and having a lost motion connection with said actuator and with said overcenter spring means;

driving toggle spring mechanism for said operator interposed between said operator and said stationary toggle support means, the said driving toggle means having a relatively greater toggle spring force of said overcenter spring means for said movable contact member.

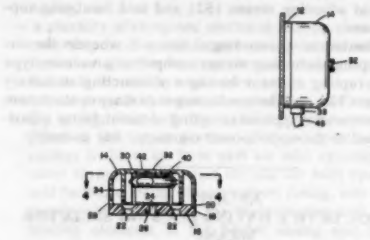
3,973,095

INTRUSION DETECTOR SENSITIVE TO RESONANT FREQUENCY OF BREAKING GLASS

Ted R. Greene, 7809 Meadowbrook Court, Pleasanton, Calif. 94566

Continuation-in-part of Ser. No. 458,339, April 5, 1974, abandoned. This application June 16, 1975, Ser. No. 587,344
Int. Cl.² H01H *3/02, 29/04;* **G08B** *13/08*
U.S. Cl. 200—61.93 **9 Claims**

1. An intrusion detector comprising a base plate, means for securing said base plate to an article to be protected, a housing rotatably secured to said base plate, a vibration sensing switch secured in said housing for sensing a particular frequency produced by the breaking of said article, said switch comprising a sealed, tubular, envelope having cylindrical evacuated cavity therein, a first electrode disposed in said cavity and extending substantially the entire length thereof, a second electrode parallel to said first electrode and disposed in one



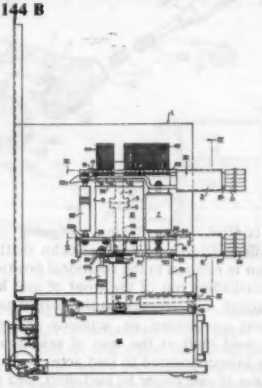
end of said cavity, and a charge of mercury disposed in said cavity.

3,973,096

ADJUSTABLE CIRCUIT-INTERRUPTER WITH IMPROVED SUPPORT MEANS

Richard J. Burgoon, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 344,014, March 22, 1973, abandoned. This application Nov. 8, 1974, Ser. No. 522,192
Int. Cl.² H01H *33/00, 1/62, 9/52;* **H02B** *1/00*
U.S. Cl. 200—144 B **16 Claims**



1. A truck-mounted roll-in-type circuit-interrupter assemblage comprising, in combination, upper and lower power conductor-bar assemblies extending in generally horizontal spaced vertical relationship and movable in a rearward direction into a circuit-operative position within a cooperating cell-structure, insulating supporting means for spacing said two horizontally-disposed power conductor-bar assemblies in spaced vertical relationship, each of said power conductor-bar assemblies having extending rearwardly thereof and disposed at the rear extremities thereof a movable primary disconnecting contact structure (**21, 38**), insulating and bridging adjusting means (**52**) for adjusting the vertical height of the upper movable primary disconnecting contact structure at the rear end of the upper power conductor-bar assembly (**21**), said insulating and bridging adjusting means (**52**) being disposed adjacent and bridging the front ends of the two horizontally-disposed power conductor-bar assemblies and adjustably fixedly secured in bridging relationship to both of the vertically-spaced conductor-bar assemblies, said insulating supporting means being disposed intermediate the forward-disposed adjusting means and the rearwardly-disposed movable primary disconnecting contact structures so that the upper power

conductor-bar assembly may pivot on the upper end of the insulating supporting means as a fulcrum point for adjustment purposes, and circuit-interrupting switching means disposed between said adjusting means (52) and said insulating supporting means.

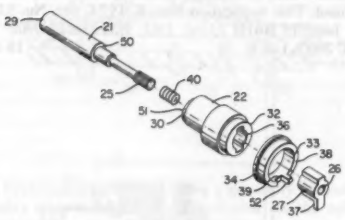
2. The combination according to claim 1, wherein the circuit-interrupting switching means comprises a vacuum-type circuit-interrupting element having a conducting stationary contact stem (12), and the conducting stationary contact stem (12) of the vacuum-type interrupting element being adjustably clamped to the upper power conductor-bar assembly.

3,973,097

CONTROL DEVICE HAVING LOCKING SELECTOR MEANS

David M. Rosenberg, and John W. Stearley, both of Indiana, Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Filed July 15, 1974, Ser. No. 488,303
Int. Cl.[2] H01H 19/58
U.S. Cl. 200—153 L 11 Claims



1. In a control device having a housing provided with a movable actuator and a rotatable selector shaft for positioning said actuator in relation to the rotational position of said shaft, said shaft extending out of the front of said housing and extending through said actuator to the rear of said housing, the improvement comprising an actuator driver telescopically carried by said shaft at the rear of said housing and being operatively interconnected to said actuator to drive the same upon rotation of said driver by said shaft, said shaft and driver being axially movable relative to said actuator, said housing having a latching means, said driver having a latching means cooperable with said latching means of said housing when said shaft is in a certain rotational and axial position relative to said housing whereby said shaft can not be rotated relative to said housing until said shaft is axially moved from said certain axial position to another axial position to clear said latching means of said driver from said latching means of said housing.

3,973,098

PISTON RING FORMING METHOD

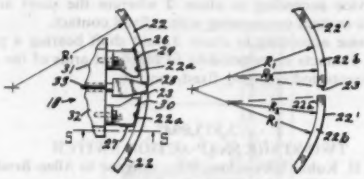
Ralph E. Harris, Greens Fork, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Jan. 10, 1975, Ser. No. 540,150
Int. Cl.[2] B21J 5/08; B23P 15/06
U.S. Cl. 219—153 12 Claims

4. A method for bending inward the ends of a formed piston ring such that a portion of the length of the ring on either side of the ring gap defines a smaller radius of curvature than the remainder of the ring, comprising:

applying heat to the inside surface of the ring along said portions of the length of the ring to a depth less than half the thickness of the ring, to a temperature sufficient and for a period of time sufficient to cause the internal structure of the heated portion of the ring to yield under thermal compression; and

allowing the heated portion of the ring to cool.

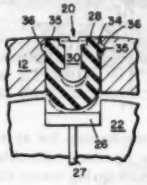


3,973,099

PUSH BUTTON SWITCH FOR ELECTRONIC WATCH

James Baker Morris, Sr., San Jose, Calif., assignor to American Micro-Systems, Inc., Santa Clara, Calif.

Filed Nov. 11, 1974, Ser. No. 522,434
Int. Cl.[2] H01H 3/12
U.S. Cl. 200—159 R 10 Claims



1. In an electronic timepiece, an improved push button electrical switch comprising:

a. frame means defining a hole;

b. moveable switch contact means utilizing a body of conductive elastomeric material occupying said hole within said frame means and electrically connected thereto through said elastomeric material and forming a switch contact surface at an interior end thereof, said contact means including a rigid push button means extending into and at least partially surrounded by said conductive elastomeric material and having an exposed portion at its exterior end;

c. a switch contact member within said frame means and adjacently spaced away from said switch contact surface,

whereby pressing the push button means deforms said elastomeric material and moves its contact surface into electrical engagement with said contact member thereby closing the switch, and releasing the push button means enables the moveable switch contact means to resume its original position and thereby open the switch.

3,973,100

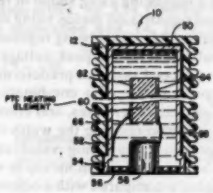
SELF-LIMITING ELECTRIC HAIR CURLER HEATER

Charles D. Flanagan, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 27, 1972, Ser. No. 318,951
Int. Cl.[2] H05B 1/00; A45D 2/36, 4/16
U.S. Cl. 219—222 4 Claims

1. An electrically heated hair curler comprising a generally cylindrical outer shell, a sealed container closely fitting into the outer shell, a heating element which has a steeply-sloped positive temperature coefficient of resistance at temperatures above an anomaly temperature mounted within the container, fusible wax heat storage means disposed within the container in heat transfer relation with the shell and substantially filling

the space between the container and the heating element, and means for making electrical connection with the element, the container being generally cylindrical in shape and being formed of electrically conductive material with an open end, the open end being exposed to form a terminal, an electrically insulative disc having an aperture therein and being received in the open end of the container and being sealingly crimped thereto, a cup-shaped terminal of electrically conductive



material being received in the disc aperture, the heater being formed of a ceramic type material and having a pair of spaced electrically conductive coatings thereon, and the means for making electrical connection with the element comprising electrically conductive leads electrically joining one of the coatings to the container and the other coating to the cup shaped terminal and physically supporting the heater within the container.

3,973,101

ELECTRIC AIR HEATING FURNACE

Andre Bosse, 3292 Prieur St. East, Montreal, Quebec, Canada (H1H 2K5)

Filed May 31, 1974, Ser. No. 475,633
Int. Cl.² H05B *1/02*; F24H *3/04*
U.S. Cl. 219—368 **11 Claims**

1. An electric furnace comprising in combination:

— an outer casing of a substantially rectangular cross-section having top, bottom, front, back and side walls, air inlet openings formed in the lower portion of the back wall and in the upper portion of said outer casing, air outlet openings formed in the lower portion of the front and side walls thereof;

— an open top support casing having walls substantially parallel to and within said outer casing, an air inlet circular opening and a further air inlet opening being formed in the upper portion and lower portion, respectively, of the back wall of said support casing, the support casing being mounted in spaced relationship with said outer casing;

— an open top heater casing within but spaced from said support casing and having walls substantially parallel to the support casing walls, an air inlet circular opening in registry with the air inlet circular opening at the upper portion of the support casing being formed in the back wall of said heater casing, air outlet openings being provided at the lower portion of the front and side walls of the heater casing, means extending through the bottom portion of the support casing for communicating the air outlet openings of the heater casing with the air outlet openings of the outer casing;

— a single cover extending over said support and heater casing;

— a plurality of elongated electrical heating elements vertically disposed in said heater casing in the airflow path therethrough, the heating elements being supported at the ends thereof by said cover; and

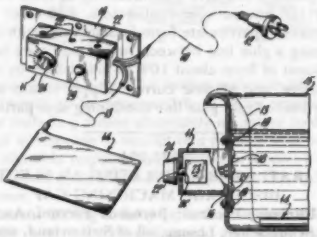
— an air propelling means mounted onto said support casing in alignment with the air inlet circular openings provided in the upper portion of the support and heater casings to blow air from said air inlet openings of said outer casing, through said circular air inlet opening and said further opening of said support casing, into the circular air inlet opening of the heater casing and along the heating elements in the heater casing and outwardly through air outlet openings provided at the bottom portion of the heater casing, and then through the communicating means into and through the air outlet openings of the outer casing.

3,973,102

HEATING AND TEMPERATURE CONTROL DEVICE FOR A BATH-LIQUID

F. Sutherland Macklem, New Canann, Conn., assignor to Equipment Development Corporation, New Canaan, Conn.

Filed Jan. 12, 1976, Ser. No. 648,038
Int. Cl.² H05B *3/06*
U.S. Cl. 219—523 **13 Claims**

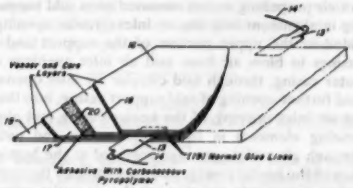


1. A bath-liquid heating and temperature control device, comprising a thermally conductive metal panel including means adapting one side of said panel for direct thermal response to a body of liquid, and a thermostat enclosure carried by the other side of said panel such that said panel forms part of at least one wall of the inner space otherwise defined by said enclosure, said enclosure having at least one vent to ambient air, whereby the air temperature of space within said enclosure is a composite reflection of both ambient-air temperature and the temperature of liquid to which said panel is thermally exposed, an electrical-heater element within said space, a power-input connection to said enclosure, thermostatic-switch means within said space and set to effectively disconnect said power-input connection from said heater element upon achievement of a predetermined upper limit of heating of said space above ambient temperature, the setting of said thermostatic-switch means being also such as to connect said heater element to said power-input connection for a detected temperature of said space below a lower limit above ambient temperature, and power-output connection means including a liquid-immersion electrical heater for immersion in the body of bath-liquid and so connected to said thermostatic-switch means that output power is deliverable via said power-output connection means coincidentally with connection of said heater element to said power-input connection, whereby said liquid-immersion heater may be effectively on-off regulated by said thermostatic-switch means in accordance with its composite response to the temperature of ambient air and of bath liquid.

3,973,103
WOOD VENEER RADIANT HEATING PANEL

Thomas D. Tadewald, La Crosse, Wis., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Apr. 21, 1975, Ser. No. 569,897
Int. Cl.² H05B 3/16
U.S. Cl. 219—543 1 Claim

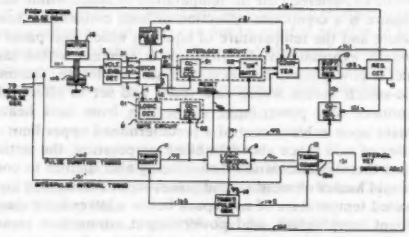


1. A multiple layer wood veneer containing laminate form of heating panel comprising at least two layers of wood veneer sheeting, a plurality of wood core layers, a thermosetting adhesive forming a glue line between the plurality of layers of said panel, a filler composition of semiconductive carbonaceous pyropolymer particles less than 100 microns in size, said particles having been formed by heating an organic pyrolyzable substance in a primarily nonoxidizing atmosphere in contact with a refractory inorganic oxide material at a temperature above about 400°C. such that the resulting semiconductive composition will have a conductivity of from about 10^{-8} to about 10^{2} inverse ohm-centimeters, said filler particles being present in particulate form in admixture with the adhesive forming a glue line between two of said core layers and in an amount of from about 10% to about 80% by weight of said adhesive, and electric current supply means to spaced apart portions of said glue line containing said particles.

3,973,104
APPARATUS FOR REGULATING AN ELECTRIC DISCHARGE MACHINING GAP

Werner Ullmann, Locarno; Bernardo Ferroni, Ascona, and Bernd Schumacher, Losone, all of Switzerland, assignors to A.G. fur industrielle Elektronik AGIE Losone b. Locarno, Losone, Switzerland

Division of Ser. No. 312,864, Dec. 7, 1972. This application July 29, 1974, Ser. No. 492,858
Claims priority, application Switzerland, Aug. 17, 1972, 12214/72
Int. Cl.² B23P 1/08
U.S. Cl. 219—69 G 9 Claims



1. Apparatus for regulating the gap between at least one tool electrode and a workpiece electrode in an electro-erosion maching having drive means including a motor (16) for varying said gap, means for applying voltage pulses of predetermined length, repeated at intervals, to said gap for production of electrical discharges and means for passing a working fluid in said gap, which apparatus comprises:

voltage measuring means for producing a first signal representative of the peak voltage of each of said pulses at said gap;

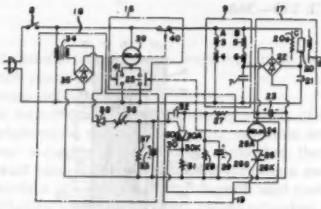
time-measuring means for producing with respect to each pulse a second signal representative of the time between the moment said pulse voltage initially exceeds a first predetermined voltage and the time said pulse voltage thereafter drops below a second predetermined voltage;

means for producing a regulating value signal in response to said first and second signals, said means being constituted so that said regulating value signal being representative of only said first signal whenever the peak voltage of one of said pulses does not exceed said first predetermined voltage, and being representative of a combination of said first and second signals in other cases, and control means for actuating said motor to regulate the width of said gap in dependence upon said regulating value signal, said control means including comparison means in which said regulating value signal is compared with a reference value to determine the deviation, if any, therebetween, and also includes servo control means for actuating said motor so as to reduce said deviation towards zero.

3,973,105
PROTECTIVE DEVICE FOR INDUCTION HEATING APPARATUS

Akihiro Tsumori, Shizuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1974, Ser. No. 514,782
Claims priority, application Japan, Oct. 24, 1973, 48-119653; Feb. 21, 1974, 49-21094; Feb. 21, 1974, 49-21095
Int. Cl.² H05B 5/04
U.S. Cl. 219—10.49 2 Claims



1. A protective device for an induction heating apparatus comprising:

an excitor circuit connected to a power voltage source for induction heating a heating element by generating an alternating magnetic field,

a detector circuit connected to the excitor circuit for detecting a change in voltage in the excitor circuit indicating an over current therein and for generating a first signal representative thereof,

a breaker circuit connected to the excitor circuit for interrupting, when activated, voltage from the power voltage source to the excitor circuit,

a driver circuit connected to the breaker circuit and to the detector circuit comprising a control element for activating the breaker circuit and a switch connected thereto for activating the control element,

a power voltage compensating circuit connected to the driver circuit for compensating for power voltage fluctuations and for generating a second signal representative of the compensated power voltage,

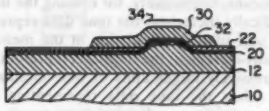
the switch having first and second inputs to receive the first and second signals respectively and activating the control element to activate the breaker circuit to interrupt the voltage from the power voltage source to the excitor circuit when the first and the second signals are of a

predetermined relationship indicating an over current in the excitor circuit.

3,973,106
THIN FILM THERMAL PRINT HEAD

Frank Ura, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 524,108, Nov. 15, 1974, abandoned.
This application Aug. 14, 1975, Ser. No. 604,694
Int. Cl.[2] H05B 1/00
U.S. Cl. 219—216 8 Claims

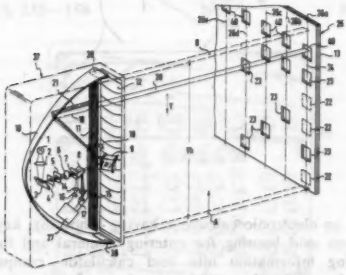


1. A thin film thermal print head for operation in an environment including a source of ions comprising:
an aluminum oxide substrate;
a layer of glass glaze covering the substrate having a plurality of mesas formed on the surface thereof;
a layer of resistive material covering the mesas to form resistive heater elements thereon;
a plurality of electrical conductors coupled to the heater elements for connecting electrical power thereto;
a layer of oxide of the resistive material covering each of the heater elements to insulate the heater elements from the ions; and
a layer of wear-resistant material covering the layer of oxide and having relatively high thermal conductivity.

3,973,107
READING DEVICE FOR OPTICALLY DETECTABLE DIGITAL CODES

Arthur Walter, Denzlingen, Germany, assignor to Erwin Sick Optik-Elektronik, Waldkirch, Germany

Filed July 29, 1974, Ser. No. 492,534
Claims priority, application Germany, Aug. 10, 1973, 2340688
Int. Cl.[2] G06K 7/10, 19/08
U.S. Cl. 235—61.11 E 27 Claims

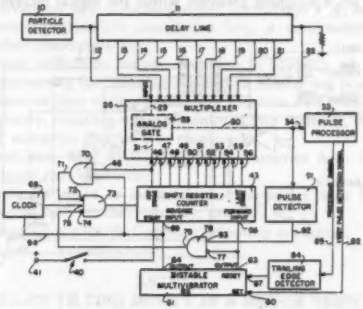


1. A reading device for optically detectable digital codes with two different light-reflecting types of fields, comprising: a scanning beam arrangement for periodically scanning the code with a sharply focused light beam and for receiving the light reflected therefrom, said scanning beam arrangement having a timing raster having two different light-reflecting types of serially-numbered fields, means for conducting part of the scanning beam via said timing raster, a timing signal photoelectric cell arranged to receive the light reflected back by said timing raster, a coding signal photoelectric cell arranged to receive the light reflected back from the code fields, an evaluation electronic system connected to the outputs of said photoelectric cells for determining the length of the code fields in units of the timing raster in the scanning direction, each code field length being associated with a number of timing fields varying between two predetermined limits.

3,973,108
PULSE STORING AND RETRIEVAL CIRCUIT

Walter R. Hogg, Miami Lakes, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Jan. 21, 1974, Ser. No. 434,894
Int. Cl.[2] G06M 11/00
U.S. Cl. 235—92 PC 21 Claims



1. A pulse storing circuit for storing and recovering serially received pulses to be processed by a pulse processor, said processor including means alternately operative to develop a first signal in response to receipt of a pulse of said pulses and a second signal in response to readiness to receive a succeeding pulse of said pulses, said pulse storing circuit including in combination;
delay means having a delay path therein and operative to serially receive and propagate said pulses along said delay path in a first direction, said delay means having a plurality of output locations at points along said delay path,
circuit means coupled to said delay means output locations and said processor and operative to couple a selected one of said output locations to said processor, said circuit means being operative in response to said first signal to sequentially couple in said first direction each of said succeeding output locations after said coupled one of said output locations, said circuit means being further operative in response to said second signal after said first signal to terminate coupling in said first direction and to sequentially couple each of said output locations to said processor in a direction reverse to said first direction.

3,973,109
NULL MONITORING SYSTEM

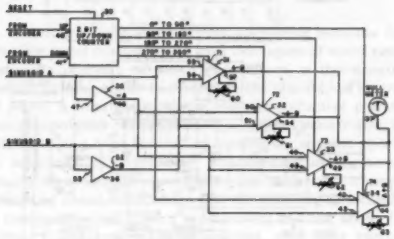
Colin E. Foster, Bensenville, Ill., assignor to Sanitary Scale Company, Belvidere, Ill.

Filed Mar. 17, 1975, Ser. No. 559,268
Int. Cl.[2] G06F 15/20; G01G 23/10
U.S. Cl. 235—151.33 14 Claims

1. In a digital incremental scale of the type which includes a weighing platform, a reticle assembly comprising a reticle having a plurality of light transmissive areas and opaque areas and displaceable by an amount proportional to the weighing platform load, a light source on one side of the reticle, and first and second light sensors on the other side of the reticle, said first and second light sensors being aligned in relation to the light source for operation with said light transmissive areas and said opaque areas and being spaced apart by approximately one-fourth the distance between adjacent light trans-

missive areas to generate first and second sinusoidal outputs which are approximately 90° out of phase with one another to thereby derive four counting pulses as said reticle is displaced by a distance equal to the distance between adjacent transmissive areas for indicating the extent and direction of reticle displacement accurate to a signal digital increment of the scale, a null monitoring system for monitoring the position of the scale weighing platform within the digital increments comprising:

combining means coupled to said first and second light sensors for combining said first and second sinusoidal outputs for providing first, second, third and fourth combined sinusoidal outputs, each of said combined sinusoidal outputs having a 90° quadrant, the instantaneous magnitude of which is indicative of the position of the scale weighing platform within the digital increments;



counting means coupled to said combining means and responsive to said counting pulses for acting upon said combining means to select individual ones of said first, second, third and fourth combined sinusoidal outputs during 90° quadrants thereof one at a time to thereby derive an analog signal indicative of the instantaneous position of the weighing platform within the digital increments; and

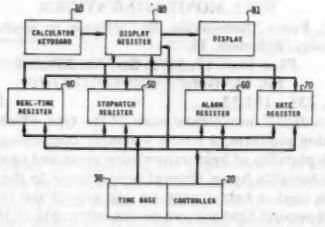
monitoring means coupled to said combining means for monitoring said selected 90° quadrants of said first, second, third and fourth combined sinusoidal outputs and for providing an analog indication of the instantaneous position of the weighing platform within the digital increments of the scale.

3,973,110

CIRCULATING SHIFT REGISTER TIME-KEEPING CIRCUIT

France Rode, Los Altos, and Eric A. Slutz, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed July 26, 1974, Ser. No. 492,303
Int. Cl.² G04C *3/00*
U.S. Cl. 235—152 **11 Claims**



1. A circulating shift register time-keeping circuit comprising:

timing means for producing a plurality of timing signals;

control means for producing a plurality of control signals;

storage means having a circulating shift register memory for storing time data representing progressively larger units of time, said time data circulating in the memory at a preselected rate in response to timing signals from the timing means, a binary adder coupled to the memory for incrementing the time data circulating therein, an auxiliary register coupled to the memory for storing incremented time data therein, and an adder controller coupled to the binary adder and auxiliary register and responsive to timing and control signals from the timing and control means, respectively, for causing the binary adder to periodically increment the time data representing the smallest unit of time circulating in the memory and to periodically increment the time data representing remaining progressively larger units of time circulating in the memory when the time data representing the largest preceding unit of time relative thereto equals preselected values and for causing the auxiliary register to modify the value of the incremented time data stored therein when that time data equals said preselected values; and

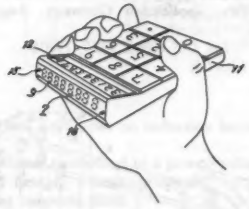
display means coupled to the storage means for displaying the time data stored therein.

3,973,111

CALCULATOR HAVING THERMAL PRINTING HEAD

Isamu Washizuka, Kyoto; Shintaro Hashimoto, and Hirotoshi Matsui, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed July 19, 1974, Ser. No. 490,006
Claims priority, application Japan, July 19, 1973, 48-86317; July 19, 1973, 48-86318; Aug. 10, 1973, 48-90171
Int. Cl.² H05B *1/00*; G06F *3/12*
U.S. Cl. 235—156 **8 Claims**



1. In an electronic calculator having a housing, keyboard means on said housing for entering numeral and function specifying information into said calculator, computation means disposed within said housing for performing computations on said entered information, and display means on said housing for displaying computation results from said computation means, the improvement comprising:

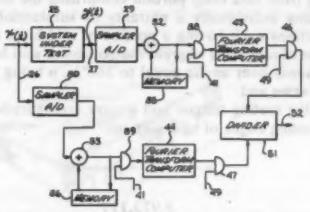
thermal print head means disposed on an external surface of said housing for printing said computation results on a heat-sensitive member which is brought into contact with said print head means from a position externally of said housing; and

switch means for supplying heating current to said thermal print head in response to said contact between said print head means and said heat-sensitive member.

3,973,112
SYSTEM FOR DETERMINING TRANSFER FUNCTION

Edwin A. Sloane, Los Altos, Calif., assignor to Time/Data Corporation, Santa Clara, Calif.

Filed July 29, 1974, Ser. No. 492,410
Int. Cl.² G06F *15/34*
U.S. Cl. 235—156 **7 Claims**



1. A system for determining the transfer function of a specimen, structure or the like from an input or driving signal and an output or response signal comprising:

first addition means for adding periodic frames of data corresponding to said input signal to provide an input signal to provide an input sum signal;

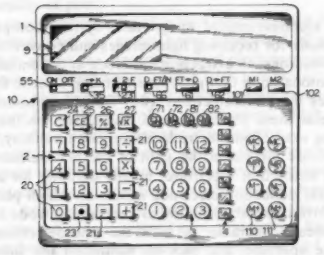
second addition means for adding periodic frames of data corresponding to said output signal to provide an output sum signal;

transform means for converting a time-domain signal to a frequency-domain signal coupled to said first and second addition means, said transform means further being inhibited until said input sum signal and output sum signal are provided; arithmetic means for forming arithmetic functions coupled to said transform means; whereby said transfer function may be computed from said transformed input sum signal and said transformed output sum signal.

3,973,113
ELECTRONIC CALCULATOR FOR FEET-INCH-FRACTION NUMERICS

Alan B. Goldsamt, Banksville Road, Greenwich, Conn. 06830

Filed Sept. 19, 1974, Ser. No. 507,621
Int. Cl.² G06F *3/02*
U.S. Cl. 235—156 **8 Claims**



1. A computing apparatus contained within a housing, comprising:

a display console consisting of three separate and distinct displays to record the results of specified computations;

a first keyboard having a plurality of character keys representing the digits 0 through 9;

primary function keys representing the arithmetic functions of addition, subtraction, multiplication and division;

a key representing an "equals" function;

a key representing a decimal point;

a key representing a "clear all" function;

a key representing a "clear last entry" function;

a key representing a percent function;

a key representing a square root function;

a second keyboard having a plurality of character keys with the 12 character keys representing the digits 1 through 12 representing, respectively, 1 through 12 inches;

a third keyboard having a plurality of character keys with the character keys representing the identified fractions of ⅛, ¼, ⅜, ½, ⅝, ¾ and ⅞;

an array of switches, including an "on/off" switch, a constant switch, a decimal selector switch, an operation selector switch;

conversion keys, including a feet-to-decimal conversion key, a decimal-to-feet conversion key, a feet-to-meters conversion key, a meters-to-feet conversion key, an inches-to-centimeters conversion key, a centimeters-to-inches conversion key;

memory utilization means, including a plurality of keys representing the "memory" functions of entering positive numerics into memory, entering negative numerics into memory, recalling numerics entered into memory, clearing numerics entered into memory.

an indicator light to indicate when numerics have been entered into a memory;

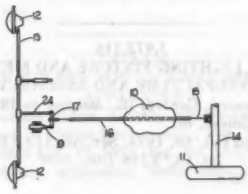
an indicator light to indicate when numerics have been entered into another memory; and

a power source for driving the computing apparatus.

3,973,114
HEADLAMP TILTING DEVICE IN A MOTOR VEHICLE

Frederick Raymond Patrick Martin, Kent, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed July 15, 1975, Ser. No. 596,141
Claims priority, application United Kingdom, July 24, 1974, 32636/74
Int. Cl.² B60Q *1/00*
U.S. Cl. 240—7.1 LJ **5 Claims**



1. In a motor vehicle having a body suspended on wheels and a headlamp mounted on said body for tilting movement in a vertical plane, a headlamp tilting device comprising (1) a sensor for sensing the attitude of said body relative to said wheels, said sensor producing an output movement related to said attitude; and (2) means operably connecting said sensor with said headlamp; said connecting means including (i) a lever connected with said headlamp and said sensor so that the output movements of said sensor are transmitted through said lever to said headlamp, and (ii) a damper, said damper having (a) a first part fixed relative to said body, (b) a second part movable relative to said first part, and (c) a damping medium which opposes relatively short term movements between said first and second parts; said lever being pivotally connected to said second part so that, when a relatively short term output movement of said sensor occurs, said lever pivots relative to said second part, whilst when a relatively long term output movement of said sensor occurs, the lever moves bodily relative to said body as a result of relative movement between said first and second parts; and said sensor, said headlamp and said second part being connected with said lever in such a manner

that a relatively long term output movement of said sensor results in a smaller overall headlamp tilting movement than that resulting from the same output movement which occurs for a relatively short term.

3,973,115

VEHICLE LAMP UNIT

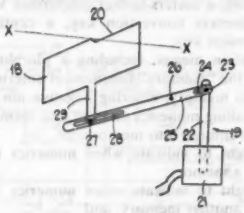
Kenneth James Jones, and Robert Arthur Hargroves, both of West Midlands, England, assignors to The Lucas Electrical Company Limited, Birmingham, England

Filed Feb. 26, 1975, Ser. No. 553,283

Claims priority, application United Kingdom, Mar. 5, 1974, 9724/74

Int. Cl.² F21V 7/00

U.S. Cl. 240—41.35 C **4 Claims**



1. A vehicle lamp unit comprising a housing having a window therein, a curved reflector, a bulbholder, a curved mirror, said reflector, bulbholder and mirror being mounted in said housing in such a manner that a light beam emanating from a bulb when mounted in said bulbholder is directed by said reflector to said mirror which reflects the light beam through said window in said housing, a mask mounted in said housing between said reflector and said mirror, means for moving said mask relative to said reflector between a first position in which it masks the light beam to a predetermined extent and a second position in which the extent of masking is decreased, and means mounting said reflector for tilting movement relative to said housing about an axis which is inclined with respect to the horizontal.

3,973,116

MINIATURE LIGHTING FIXTURE AND METHODS OF MANUFACTURE AND ASSEMBLY

Edward J. Leonard, Geneva, Ill., assignor to Illinois Hobbycraft, Inc., Geneva, Ill.

Filed Oct. 10, 1974, Ser. No. 513,532

Int. Cl.² F21S 1/06, 3/06

U.S. Cl. 240—78 F **6 Claims**

1. A miniature lighting fixture comprising
a frame,
means attached to said frame for supporting a light source,
a light source mounted in said support means and
electrical leads attached to said light source,
said frame including a groove formed in at least an elongated portion of the periphery of said frame for receiving and retaining said leads wherein said groove extends around the periphery of said frame and said leads are cemented along said groove to a point at an upper portion of said frame whereat said leads extend from said groove and from said frame.

5. A method of manufacturing a miniature lighting fixture having a centrally disposed body portion and a plurality of radially outwardly extending elongated portions or arms extending from said body portion comprising the steps of
molding individually a plurality of substantially identical sections each having a portion of said body portion and one of said arms wherein the portion of said body portion extends over an arc equal to $360°/n$, n being the number of arms and
forming mating tongue and groove configurations on confronting edges of said sections.

3,973,117

ELECTRON-OPTICAL IMAGE TUBES

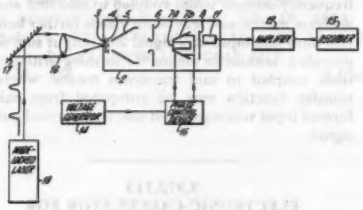
Daniel Joseph Bradley, 73 Lambton Road, Wimbledon, London SW20, England

Filed July 23, 1973, Ser. No. 381,616

Claims priority, application United Kingdom, July 24, 1972, 34544/72

Int. Cl.² H01J 31/26; H04B 9/00

U.S. Cl. 250—199 **2 Claims**

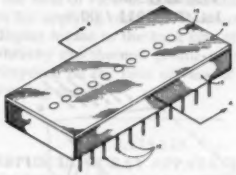


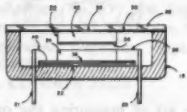
1. An electron-optical image tube system comprising a photocathode for receiving light images and converting them to photoelectrons, an extraction electrode at the emission side of the photocathode that generates a strong electric field and accelerates the photoelectrons away from the photocathode and projects these photoelectrons into a path on the output side of the extraction electrode at increased velocity, deflection electrode means on the path of the photoelectrons beyond the extraction electrode, means defining an aperture beyond said deflection electrode means on which photoelectrons received directly from the extraction electrode impinge, control means operable to scan the photoelectron image across the aperture, and pick-up means on the side of the aperture remote from the electrodes to receive photoelectrons passing through the aperture, a source of ultra-short light pulses, means providing an image of said pulses at the photocathode, voltage generating means connected to said deflection electrode means and providing voltages thereto, phase control means controlling the phase of the voltages applied to said deflection electrode means to produce a circular or spiral deflection path on said means defining said aperture, and adjustable optical delay means in the path of the light pulses to the photocathode.

3,973,118
ELECTRO-OPTICAL DETECTOR ARRAY AND SPECTRUM ANALYZER SYSTEM

Joseph Alfred LaMontagne, 63 Chestnut St., Andover, Mass. 01810

Filed Mar. 25, 1975, Ser. No. 561,882
Int. Cl.² G01J 3/38, 3/50
U.S. Cl. 250—226 7 Claims





1. A device for optically detecting and identifying narrow wavelengths of the electromagnetic spectrum comprising:

a housing having an open top and being impervious to penetrations of electromagnetic waves;

a plurality of electrically conductive pins extending through said housing;

a substrate affixed to the bottom of the inside of said housing and having an electrically conductive coating on its upper surface, said upper surface facing toward the open top of said housing, said coating connected by an electrically conductive wire to one of the aforementioned pins;

a plurality of photodetectors each having a first and second electrical pole and each photodetector being individually mounted on said substrate so that the photosensitive surface of each photodetector faces upward toward the open top of the housing and the first electrical pole of each photodetector makes contact with the electrically conductive coating on the substrate and the second pole of each photodetector is attached to only one of the plurality of pins;

a top cover positioned and sealed over the open top of said housing, said top cover being composed of a material which allows the transmission of electromagnetic wavelengths and said cover coated with a substance impervious to the penetration of electromagnetic wavelengths except for a plurality of uncoated areas, which uncoated areas admit electromagnetic wavelengths;

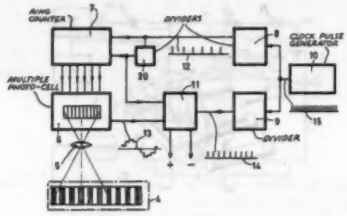
a plurality of narrow band optical filters each allowing passage of different known wavelength segments of the electromagnetic spectrum, each narrow band optical filter being affixed to the underside of the top cover directly below an uncoated area, said narrow band optical filter being larger than said uncoated area and each narrow band optical filter being positioned directly above the photosensitive area of one of the photodetectors so that the photodetectors are shielded from extraneous spectral components;

metering means attached to said pins for reading changes in the electrical output of each photodetector that is excited by an electromagnetic wave whereby said unknown electromagnetic wavelength can be identified by comparing it with the known wavelength admittance characteristics of the narrow band optical filter located above the excited photodetector.

3,973,119
DEVICE FOR DETERMINING THE DISPLACEMENT OF A MACHINE TOOL COMPONENT

Hendrik Renes, and Joannes Gregorius Bremer, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 10, 1975, Ser. No. 556,820
Claims priority, application Netherlands, Mar. 15, 1974, 7403468
Int. Cl.² G01B 11/04
U.S. Cl. 250—231 R 3 Claims

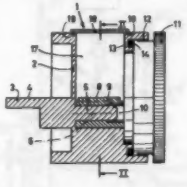


1. A device for determining the displacement of a machine tool component, comprising a periodic grating mechanically attached to the component, a radiation source means for projecting radiation onto said grating, a plurality of aligned photo-cells arranged sequentially in ordered groups of at least two photo-cells, means for projecting an image of a portion of the grating onto said photo-cells, each period of said projected grating image spanning one of said groups of said photo-cells, and interrogating means for periodically sequentially activating the photo-cells in each of said ordered groups of photo-cells and for simultaneously activating each of the photo-cells of an activated order, whereby a plurality of photo-cells having substantially the same spacing as the period of said grating image are simultaneously activated and whereby the location of said activated photo-cells periodically shifts in a predetermined direction.

3,973,120
SPECIMEN HOLDER FOR AN X-RAY DIFFRACTION APPARATUS

Henricus Mathias Marie Kessels, Eindhoven, Netherlands, assignor to U.S. Philips Corporation , New York, N.Y.

Filed Feb. 27, 1975, Ser. No. 553,746
Claims priority, application Netherlands, Mar. 7, 1974, 7403065
Int. Cl.² H01J 37/20
U.S. Cl. 250—272 5 Claims

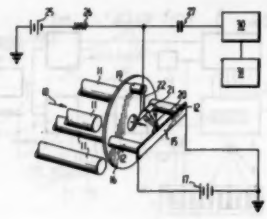


1. A holder for an X-ray diffraction specimen which is to be fixed in a space to be conditioned comprising an evacuable housing that is provided with an external jacket, an external abutment face, a removable support table occupying a fixed position with respect to the said abutment face, said support table receiving said specimen, and with a radiation window preferably of beryllium, said window extending at least over a portion of said jacket about said specimen table.

3,973,121
DETECTOR FOR HEAVY IONS FOLLOWING MASS ANALYSIS

Wade L. Fite, 305 Pasadena Drive, Pittsburgh, Pa. 15215, and Richard L. Myers, Rte. 1, Box 225, Harmony, Pa. 16037

Continuation-in-part of Ser. No. 319,442, Dec. 29, 1972, Pat. No. 3,808,433. This application Apr. 29, 1974, Ser. No. 465,163
Int. Cl.[2] H01J 39/34
U.S. Cl. 250—292 17 Claims

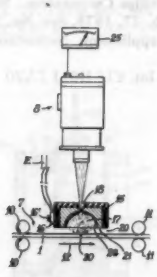


1. A method for detecting macromolecular ions emerging from the exit end of a device which separates said macromolecular ions on the base of their charge-to-mass ratios, said method comprising the impinging of said emerging macromolecular ions having a uniform charge-to-mass ratio upon a hot surface whereupon said macromolecular ions decompose at the high temperature of the heated surface into fragments, at least some of said fragments being surface ionizable by said hot surface evolving from said hot surface as a burst of ions and discerning the burst of ions so produced by detection of its electrical charge.

3,973,122
MEASURING APPARATUS

Arthur E. Goldberg, Evanston, Ill., assignor to Ixcon Inc., Skokie, Ill.

Filed June 17, 1974, Ser. No. 479,602
Int. Cl.[2] G01J 1/00
U.S. Cl. 250—338 16 Claims

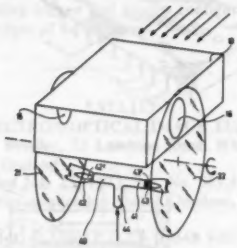


1. Apparatus for examining the thickness of a moving film, comprising a body having an area constituting a source of infrared rays across which a film to be examined may be moved, means for heating the area to a constant temperature for maintaining uniform infrared light intensity throughout said area, and infrared ray measuring means positioned to receive rays from said source that have passed through a part of said moving film for determining the diminution of intensity of such infrared rays in passing through the film.

3,973,123
MEASURING TRANSPARENCY OF GASES, PARTICULARLY THE OPTICAL TRANSMISSION OF INTERNAL COMBUSTION ENGINE EXHAUST GASES

Dietrich Adolph, Ebersbach, Fils, and Walter Dinkelacker, Stuttgart, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed May 21, 1975, Ser. No. 579,463
Claims priority, application Germany, May 28, 1974, 2425876; Mar. 21, 1975, 2512538
Int. Cl.[2] G01J 1/00
U.S. Cl. 250—343 17 Claims



14. In the art of measuring the optical transmissivity of gases, having a measuring chamber formed with an opening therein to permit the passage of a beam of light there-through, and transparent cover means closing off said opening,

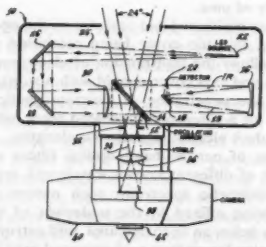
the method to prevent contaminating deposits from accumulating on said cover means comprising the step of

burning off deposits on the transparent cover means resulting from passage of the gases through the chamber by raising the temperature of said transparent cover means at least at the surface facing the chamber to a temperature sufficient to burn off said deposits.

3,973,124
INFRARED LINE SCANNING INSTRUMENT

Robert W. Astheimer, Westport, Conn., assignor to Barnes Engineering Company, Stamford, Conn.

Filed May 19, 1975, Ser. No. 578,781
Int. Cl.[2] H01J 31/49
U.S. Cl. 250—334 9 Claims



1. An infrared line scanning instrument for scanning a line on a target in the field of view of the instrument and superimposing the thermal profile of the scanned line on a visual view of the target comprising, in combination,

a. a scanning mirror and scanning means for scanning said scanning mirror over a line of the field of view of said instrument,

b. said scanning mirror being transparent in the visible region of the electromagnetic radiation spectrum and reflective in the infrared radiation region,

c. viewing means for observing the field of view of said instrument through said scanning mirror,
d. infrared detector means for receiving infrared radiation from the field of view of said instrument reflected from said scanning mirror,
e. a multiple element display means,
f. means coupling said infrared detector means to said multiple element display means for activating elements in said display means in accordance with the intensity of the infrared radiation applied to said infrared detector means from the field of view of said instrument, and
g. means for applying radiation from activated elements in said display means to the back side of said scanning mirror whereby the thermal profile of the scanned line is superimposed on the field of view of said instrument in said viewing means.

3,973,125
CORPUSCULAR-RAY APPARATUS WITH A CRYOGENICALLY COOLED SPECIMEN SPACE

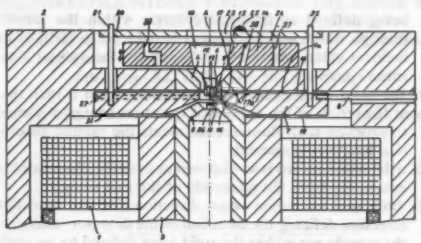
Wolfram Loebe, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation of Ser. No. 151,808, June 10, 1971, abandoned, which is a continuation of Ser. No. 577,370, Sept. 6, 1966, abandoned. This application June 23, 1975, Ser. No. 589,577

Claims priority, application Germany, Sept. 16, 1965, 99446; July 8, 1966, 104688

Int. Cl.² G01N *23/20*

U.S. Cl. 250—443 **13 Claims**



1. In a charged particle-beam apparatus, a lens device comprising a charged particle-beam lens defining a beam axis and having two centrally apertured lens members formed of magnetic material and axially spaced from each other to form a space therebetween, the apertures of the lens members defining a lens bore, specimen holder means extending axially into the lens bore for holding a specimen therein, a first cooling body situated in said space between said lens members in heat insulating relation to the lens members and extending about the axis in a plane substantially perpendicular to the latter, the first cooling body consisting of non-magnetic material and having a central opening at least substantially equal in diameter to the lens bore so that the first cooling body is prevented from protruding into said lens bore, said central opening being defined by an inner wall of said first cooling body extending axially between the lens members and circumferentially facing said specimen holder means, heat-conductive connecting means for connecting the first cooling body to a cryogenic source, whereby the surface of the first cooling body, when cooled, reduces soiling of the specimen, a second cooling body disposed above said lens, the specimen holder means having a face directed away from the lens, the second cooling body being located adjacent said face of said specimen holder means and being formed with a central opening surrounding the beam axis and having a diameter larger than the specimen holder means and at least as large as the diameter of said lens bore whereby said second cooling body is prevented from protruding into said lens bore, and a second heat-conductive connecting means attached to the second cooling body for communicating with the cryogenic source.

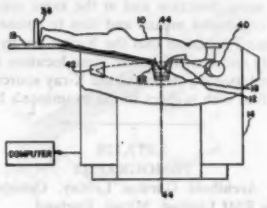
3,973,126
MAMMOGRAPHY

Rowland W. Redington, Schenectady, and John L. Henkes, Jr., Latham, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed July 31, 1975, Ser. No. 600,874

Int. Cl.² G03B *41/16*

U.S. Cl. 250—444 **23 Claims**



1. An improved mammograph adapted for the tomographic, x-ray examination of human mammae of the type including an x-ray source disposed adjacent a mamma, a detector disposed adjacent said mamma and opposite said x-ray source, and means for receiving electrical signals from said detector and for providing therefrom tomographic images of the internal structure of said mamma; comprising as an improvement:
means for positioning and supporting a female humanoid patient in prone position with pendant mamma;
a fluid medium disposed about and surrounding said pendant mamma; and
scanning means for rotating said x-ray source and said detector about a vertical axis passing through said mamma.

3,973,127
X-RAY TOMOGRAPHY APPARATUS

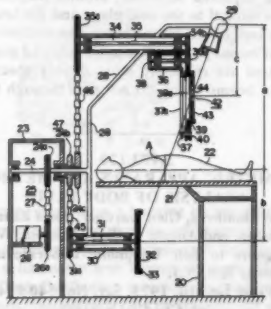
Tadayoshi Matsuda, Tokyo; Mitsuo Yuasa, Yokohama, and Kenji Aoyama, Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 6, 1975, Ser. No. 619,963

Claims priority, application Japan, Oct. 9, 1974, 49-116436; Aug. 15, 1975, 50-99373; Aug. 15, 1975, 50-112706[U]

Int. Cl.² G01N *23/02*

U.S. Cl. 250—445 T **11 Claims**



1. An X-ray tomography apparatus comprising a seat board for seating an object body for medical examination having a

cross section requiring X-ray tomography; an X-ray source for irradiating X-rays toward said examinee's body; rotating film supporting means for holding a film in parallel relationship with the cross section of the examinee's body for photographying X-ray images of the section of the examinee's body through which the X-ray flux passes; rotating collimator means disposed between said X-ray source and said seat board for the body and provided with an opening parallel with the cross section of the examinee's body for restricting the cross section of the X-ray flux emitted from the X-ray source to the desired location and dimensions on the cross section of the body; and a drive mechanism for causing the X-ray source, collimator means, and film to revolve about the examinee's body in the same direction and at the same speed, and also causing the collimator means and film to rotate about their axis at said same speed so that the X-rays are irradiated only onto the body and the film at the same location regardless of the relative rotational position of the X-ray source, collimator means, and film with respect to the examinee's body.

3,973,128

TOMOGRAPHY

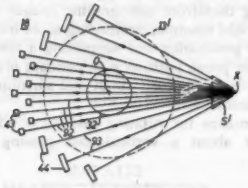
Christopher Archibald Gordon LeMay, Osterley, England, assignor to EMI Limited, Mayes, England

Filed July 31, 1974, Ser. No. 493,403

Claims priority, application United Kingdom, Aug. 18, 1973, 39145/73

Int. Cl.² G01N *23/00*

U.S. Cl. 250—445 T **13 Claims**



1. Apparatus for examining a body by means of penetrating radiation, such as X- or γ- radiation, comprising a radiation source projecting radiation in a plane, a plurality of detectors in said plane spaced from said source to provide space for locating the body between the source and detectors so that a plane section of the body is irradiated by said radiation, the lateral extent of the radiation being sufficient to irradiate a substantial area of said plane section, said plurality of detectors including collimators and being laterally spaced to detect radiation along different beams within the lateral extent of said radiation, a rotatable support on which the source and detectors are mounted to rotate, around the body, about a common axis normal to the said plane and the lateral spacing of the centrelines of the beams being non-uniform so that the centrelines of beams passing through a selected portion of said substantial area are relatively more closely spaced than the centrelines of beams which do not pass through the selected portion.

3,973,129

FLUORIMETRIC APPARATUS AND METHOD FOR ANALYSIS OF BODY FLUID

William Emil Blumberg, Glen Gardner; Josef Eisinger, Bethlehem Township, and Angelo Anthony Lamola, Warren, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

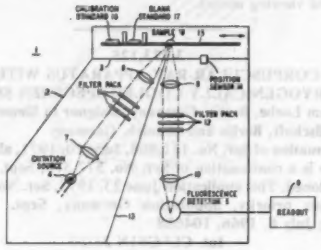
Filed Jan. 10, 1975, Ser. No. 540,074

Int. Cl.² G01N *21/38*

U.S. Cl. 250—461 B **29 Claims**

1. Fluorimeter for investigation of a sample derived from a body fluid comprising excitation means for producing a beam of irradiating energy of spectral content including energy which is absorbed by such sample to produce fluorescence, presence and/or intensity of which is indicative of a condition under study and detection means including a detector for detecting such radiation characterized in that:

1. the said sample is supported by support means which is essentially transparent to a spectral portion contained within the excitation beam resulting in the said fluorescence;
2. said excitation means emits a beam directed to the underside of the said sample;
3. the said sample has an absorption length of a maximum of one millimeter in the direction of the said excitation beam for the said spectral portion, absorption length



being defined as traversal distance within the sample through which incident energy is reduced to 1/*e*th of its incident value, wherein *e* is the base of the natural logarithm system;

4. the spectral content of said excitation beam is such that at least 90% of the contained quantum energy absorbed to produce such fluorescence meets the recited absorption length requirement;
5. a detection means is so disposed as to detect fluorescence emanating from the underside of the said sample;
6. both said excitation beam direction and the detection direction defining the direction of the detector relative to the sample are within the solid cone defined by an angle of 45° from a direction normal to the underside of the said sample.

3,973,130

APPARATUS FOR RECORDING INFORMATION ON A FILM

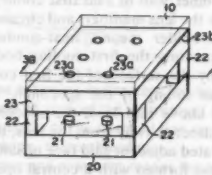
Hiroshi Amemiya, Fujisawa, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed May 7, 1974, Ser. No. 467,834

Claims priority, application Japan, May 12, 1973, 48-52772; Nov. 5, 1973, 48-123395

Int. Cl.² H05G *1/28*

U.S. Cl. 250—476 **7 Claims**



1. An apparatus for recording information on X-ray film comprising:

a pair of sensitized sheets for covering both sides of a sheet of photographic film to impress an image on said film in response to X-rays impinging on at least one of said sheets,

an opening formed in corresponding corners of both of said sensitized sheets,

an X-ray shield fitted into said opening in one of said sensitized sheets,

a recording head fitted into said opening in said other sensitized sheet, said recording head including a plurality of light-emitting diodes arranged in a prescribed pattern, a substrate on which said light-emitting diodes are mounted, and a light-impermeable plate provided with a light-emitting surface and bored with vertical holes for passing light emitted by said light-emitting diodes to impress optical information bearing a prescribed pattern on a part of the surface of said film contacting said light-emitting surface, said holes of said light-impermeable plate having side walls outwardly inclined with the diameter progressively enlarged toward said light emitting surface, said inclined side walls being fitted with light reflecting plates and said light-emitting diodes being received in said holes so as not to project above said light-emitting surface.

3,973,131

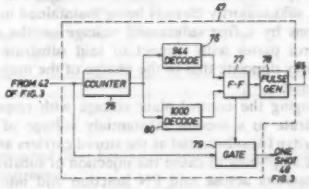
PULSED NEUTRON LOGGING: MULTIPURPOSE LOGGING SONDE FOR CHANGING TYPES OF LOGS IN THE BOREHOLE WITHOUT BRINGING THE SONDE TO THE SURFACE

Steve G. Malone, and Obie M. Langford, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 26, 1974, Ser. No. 536,532

Int. Cl.² G21G 4/02; G01V 5/00

U.S. Cl. 250—502 **15 Claims**



1. A system for logging well bores with repetitive pulses of high energy neutrons, comprising:

a fluid-tight logging tool sized and adapted for passage through a well bore by means of an armored electrical cable coupled thereto, said cable having at least one electrical conductor and an electrical ground,

means in said logging tool for generating repetitive pulses of high energy neutrons in response to input signals,

at least two channel means respectively for generating input signals at different repetition rates,

means in said tool for selectively coupling one of said channel means to said neutron generating means,

means in said tool for generating a high voltage potential for the operation of said neutron generating means;

means for selectively supplying electrical control signals via said electrical conductor to said logging tool, and

decoder means in said tool responsive to said control signals for selectively coupling one of said channel means to said high voltage generating means.

3,973,132

APPARATUS FOR THE TREATMENT OF NON-CONDUCTIVE FOILS OR LIKE THIN SHEETING

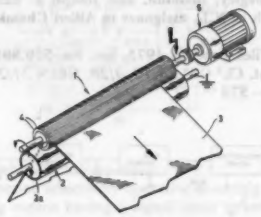
Eckhard Prinz, Rotenbek, and Wolfgang Henneberg, Norderstedt, both of Germany, assignors to Softal Elektronik GmbH, Hamburg, Germany

Filed Apr. 14, 1975, Ser. No. 567,501

Claims priority, application Germany, Apr. 27, 1974, 149658[U]

Int. Cl.² B01K 1/00; H01T 19/04

U.S. Cl. 250—531 **7 Claims**



1. In apparatus for the treatment of non-conductive foils and like thin sheeting by subjecting said sheeting to a corona discharge, said apparatus including first and second elongated electrodes, means supporting said electrodes to define a gap between said electrodes and means for passing said sheeting through said gap, the second electrode having a smooth, foil-engaging surface, the improvement wherein said first electrode is in the form of a revolving profiled roller, said roller having a profile comprising a series of ridges and troughs between said ridges, said ridges and said troughs extending along the length of said roller parallel to the axis thereof.

3,973,133

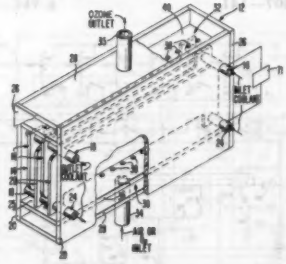
OZONE GENERATOR

Willard F. Emigh, El Dorado Hills, and Rudi Beichel, Sacramento, both of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Division of Ser. No. 450,698, March 13, 1974, Pat. No. 3,872,313. This application Jan. 2, 1975, Ser. No. 538,286

Int. Cl.² C01B 13/11

U.S. Cl. 250—532 **2 Claims**



1. In an ozone generator: a housing having a fluid inlet end and a fluid outlet end; a plurality of reactor plates; means mounting said reactor plates within said housing in spaced, side by side relationship with respect to each other; and first and second fluid distribution means adjacent to the inlet and the outlet ends, respectively of said housing for permitting a fluid to flow uniformly into spaces between the plates, the second means including means for generating a back pressure in the spaces between the plates before permitting the fluid to flow through the outlet end to facilitate a homogeneous fluid

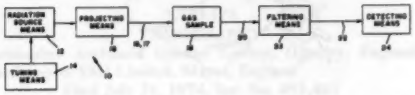
flow past the reactor plates in the housing, the back pressure generating means comprising wall means disposed transversely to the plates and separating a portion of the housing occupied by the plates from the outlet, the wall means including a plurality of openings evenly distributed over the wall means, each opening being of a lesser transverse extent than the outlet.

3,973,134

GENERATION OF COHERENT ROTATIONAL ANTI-STOKES SPECTRA

Richard F. Begley, Boonton, and Joseph J. Barrett, Morris Plains, both of N.J., assignors to Allied Chemical Corporation, N.J.

Filed Feb. 18, 1975, Ser. No. 550,801
Int. Cl.[2] G01J *3/10, 3/28;* G01N *21/22*
U.S. Cl. 250—574 11 Claims



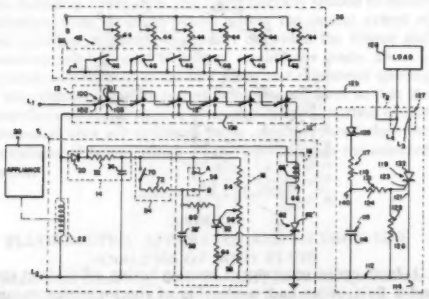
1. Apparatus for analyzing light, comprising:
a. radiation source means for generating two coherent beams of monochromatic light;
b. tuning means for adjusting the frequency difference between said beams of radiation to equal substantially the rotational frequency of a preselected constituent of gaseous material;
c. projecting means for directing said beams of light through said gaseous material to produce scattered radiation containing a detectable signal composed of an anti-Stokes component generated coherently during scattering;
d. filtering means adapted to receive said scattered light and selectively transmit said signal;
e. detecting means for indicating the intensity of said signal.

3,973,135

CONTROL CIRCUIT WITH END OF CYCLE INDICATION

Charles E. Scott, Indianapolis, Ind., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed May 12, 1975, Ser. No. 576,733
Int. Cl.[2] G08B *1/00*
U.S. Cl. 307—141 6 Claims



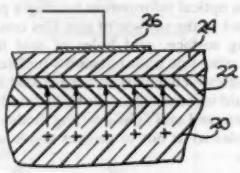
1. A control circuit comprising a power switching means; a first timing means including a power turn-off means connected to one side of said power switching means, a first load and actuation means connecting said first timing means to said first load; a second timing means including a solid state timer switch circuit utilizing a solid-state switching device connected between said one side and a second side of said power switching means; said power turn-off means further including means connected to said power switching means to actuate same; a second load, said second timing means including terminal means connecting said solid state switching device to said second load.

3,973,136

CHARGE COUPLED DISPLAY DEVICE

William W. Y. Lee, 8451 Sedan Ave., Canoga Park, Calif. 91304

Continuation-in-part of Ser. No. 412,487, Nov. 2, 1973, abandoned. This application Sept. 16, 1974, Ser. No. 506,425
Int. Cl.[2] H01L *33/00*
U.S. Cl. 307—221 D 15 Claims



1. A method of providing controlled emission comprising:
a. providing a charge coupled device having a substrate with at least a first surface layer of a first conductivity type forming a PN junction with said substrate, a second insulative layer over said first layer, a plurality of charge coupled device control plates over said second layer, and an injection means for controllably injecting majority carriers into said first layer adjacent one of said plurality of control plates;
b. providing a reverse bias on said PN junction for the back biasing thereof;
c. simultaneously controlling said control plates and said injection means to result in a storage of majority carriers adjacent said PN junction at a plurality of control plate locations so that each location obtains a charge dependent upon the desired intensity of emission at that location, said majority carriers being maintained in depletion regions by a first substantial voltage on the respective control plates with respect to said substrate having a polarity opposite that of the charge of the majority carriers, and
d. changing the control plate voltage with respect to the substrate to a second substantialy voltage of the same polarityp**16psubstantial** as the stored carriers and of sufficient amplitude to cause the injection of substrate majority carriers across said PN junction and into said first layer in a quantity controlled by the charge stored at each respective control plate location to cause light emission.

3,973,137

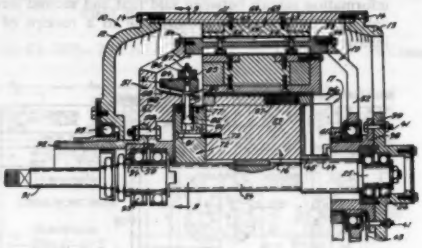
MULTI-ROTOR ELECTRIC MOTOR

Dezso Donald Drobina, 201-233 E. 14 Ave., Vancouver, British Columbia, Canada (V5T 2M7)

Filed June 16, 1975, Ser. No. 586,949
Int. Cl.[2] H02K *21/10*
U.S. Cl. 310—114 5 Claims

1. A multi-rotor electric motor comprising:
a. a housing,
b. a main rotor having a drive shaft mounted for rotation in the housing, the main rotor having windings and a commutator,
c. a cup-shaped wound stator mounted in the housing extending circumferentially around the main rotor and being adapted when connected to a source of polyphase electric power to provide a rotating magnetic field so as to induce rotation of the main rotor,
d. a secondary rotor rotatably mounted on the drive shaft of the main rotor, the secondary rotor having permanent

magnets secured thereto and disposed so that under the influence of the rotating magnetic field the secondary rotor rotates in the same direction as the main rotor.

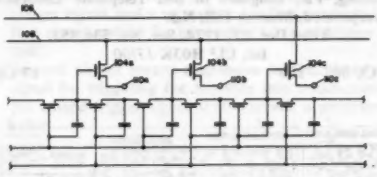


e. a spring-engaged centrifugally-opened clutch assembly for connecting the main and secondary rotors for mutual rotation when speed of the main rotor is a pre-determined amount less than synchronous speed of the secondary rotor.

3,973,138
BUCKET BRIGADE TRANSVERSAL FILTER

Charles M. Puckette, and Walter J. Butler, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 5, 1975, Ser. No. 574,239
Int. Cl.² G11C *19/18, 19/28*
U.S. Cl. 307—221 D **6 Claims**



1. A transversal filter having predetermined weighting coefficients comprising:

a bucket brigade delay line of the type having a plurality of serially arranged capacitive charge storage locations connected by semiconductor switches wherein:

a first plurality of said serially-arranged charge storage locations comprises capacitors of a first capacitance, said first plurality including every other charge storage location of said plurality of serially arranged charge storage locations, and

a second plurality of charge storage locations comprises capacitors at the remaining capacitive charge storage locations of said plurality of capacitive charge storage locations; said capacitors of said second plurality characterized by capacitances of different selected magnitudes such that the transfer of a given quantity of charge will produce a preselected voltage change at each of said charge storage locations

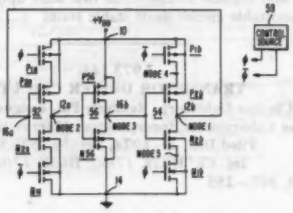
said selected magnitudes determined according to said predetermined weighting coefficients,

said transversal filter further including means summing said voltage changes for providing an output voltage proportional thereto such that a desired output transfer function is obtained.

3,973,139
LOW POWER COUNTING CIRCUITS

Andrew Gordon Francis Dingwall, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 23, 1973, Ser. No. 363,255
Int. Cl.² H03K *23/02, 17/60, 19/08, 19/40*
U.S. Cl. 307—225 C **10 Claims**



1. The combination comprising:

first and second selectively operative inverting means, each inverting means having a signal input terminal, a power input terminal means and an output;

an inverter having an input connected to said output of said first inverting means, and having an output connected to said signal input terminal of said second inverting means;

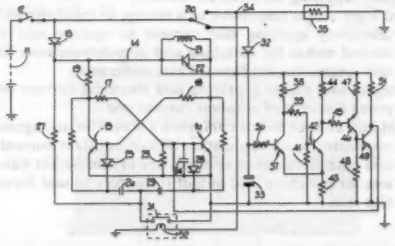
means connecting said output of said second inverting means to said signal input terminal of said first inverting means; and

means for applying control signals to the power input terminal means of said first and second inverting means to render operative said first inverting means and render inoperative said second inverter during one time interval and for rendering inoperative said first inverting means and rendering operative said second inverting means during another time interval.

3,973,140
CONTROL CIRCUITS FOR VEHICLE REAR WINDOW HEATERS

Edward Graham Phillips, Colne, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Jan. 27, 1975, Ser. No. 544,628
Claims priority, application United Kingdom, Jan. 29, 1974, 3984/74
Int. Cl.² H03K *17/26;* **H05B** *1/02;* **B60L** *1/02*
U.S. Cl. 307—247 A **3 Claims**



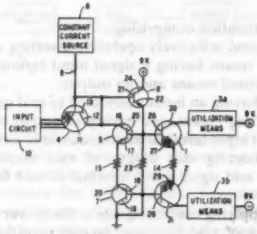
1. A control circuit for a vehicle rear window heater comprising, in combination: a bistable circuit having first and second states, having means for connection to a supply, and being biased so as to occupy a first state when connected to the supply by said means, switch means operably connected to said bistable circuit and occupying first and second positions when said bistable circuit is in its first and second states, respectively, an output terminal operatively connected to said

switch means and for connection to the heater, said switch means providing power to said output terminal when moved to its second position, a normally open switch connected to said bistable circuit for changing the state of the bistable circuit each time it is operated, and a monostable circuit coupled to said switch means so as to be held in its unstable state when said switch means is in its first position, said monostable circuit being coupled to said bistable circuit, so as to switch said bistable circuit to its first state upon reversion of the monostable circuit to its stable state.

3,973,141
TRANSISTOR DRIVER CIRCUIT

David Clayton Goldthorp, Reading, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 27, 1974, Ser. No. 536,851
Int. Cl.² H02K *17/00;* **H03K** *17/60*
U.S. Cl. 307—255 **13 Claims**



1. An electrical switch circuit comprising

a pair of output transistors of oppositely conductive type and each having base and collector electrodes and at least one emitter electrode,

each of said collector electrodes forming and output terminal of said circuit,

a resistor connected between said at least one emitter electrode of a first one of said transistors and said at least one emitter electrode of a second one of said transistors,

bias control means connected to said base electrode of said first one of said transistors for steady state reverse bias of both of said transistors and operable for switching said transistors to a forward bias state,

a source of DC potential connected to said base electrode of a second one of said transistors,

means supplying an electrical current,

and logic means responsive to a receipt of input signals for selectively applying said current to operate said bias control means for switching said output transistors from said reverse to said forward bias state, and

wherein said means supplying said electrical current comprises a source of constant current and

said bias control means comprises a transistor arrangement responsive to an application of said constant current to said base electrode of said first one of said output transistors for switching said output transistors to said forward bias state.

3,973,142
SWITCH TURN OFF CIRCUITRY FOR SEMICONDUCTOR BRIDGE

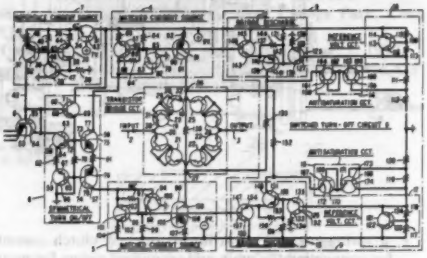
Donald Gifford Hill, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 27, 1974, Ser. No. 536,852
Int. Cl.² H03K *17/00*
U.S. Cl. 307—255 **8 Claims**

1. An electronic switch comprising

a semiconductor bridge having first and second signaling terminals, and bias control terminals;

semiconductor circuit means activatable for connecting electrical voltages to said control terminals for forward biasing said bridge to effect a transmission of electrical information signals between said first and second terminals and deactivatable in response to a receipt of an instruction signal,

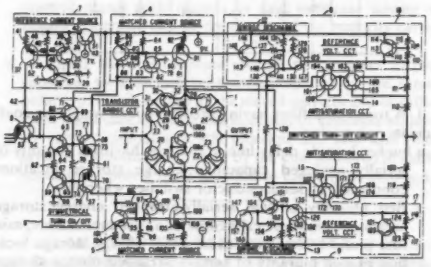


and semiconductor means activated in response to a receipt of said instruction signal for concurrently cooperating with said circuit means upon its deactivation for reversing the connections of said voltages to said control terminals to reverse bias said bridge to interrupt said information signal transmitting between said first and second terminals.

3,973,143
BIAS CONTROL CIRCUITRY FOR SEMICONDUCTOR BRIDGE

Milton Luther Embree, and David Clayton Goldthorp, both of Reading, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 27, 1974, Ser. No. 536,853
Int. Cl.² H03K *17/00*
U.S. Cl. 307—255 **17 Claims**



1. An electronic switch comprising:

a semiconductor bridge having first and second signaling terminals and bias control terminals,

a pair of current sources connected to said control terminals and activatable for providing matched currents to said control terminals for forward biasing said bridge to convey electrical information signals between said first and second terminals, and

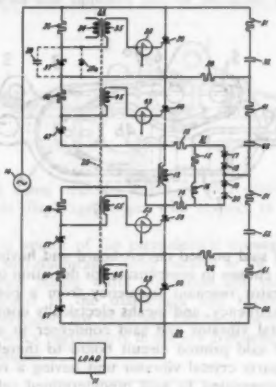
means connecting said sources in series and responsive to a receipt of an instruction signal for serially applying a joint electrical bias concurrently to both of said sources and for activating each of said sources to provide said matched currents to said control terminals for said forward bias of said bridge.

3,973,144

THYRISTOR TRIGGER CIRCUIT ENABLED BY THYRISTOR FORWARD VOLTAGE LEVEL

Dante E. Piccone, Glenmoore, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed July 1, 1975, Ser. No. 592,302
Int. Cl.² H03K 17/72
U.S. Cl. 307—252 N 8 Claims



1. A circuit for triggering a thyristor into conduction comprising:
   a. first circuit means responsive to the voltage across the thyristor for generating a bias signal representative of the voltage across the thyristor;
   b. a transformer having a primary winding responsive to a trigger signal, and a secondary winding connected to the first circuit output for generating a biased trigger signal; and
   c. second circuit means responsive to the biased trigger signal for triggering the thyristor into conduction when the biased trigger signal level exceeds a predetermined value.

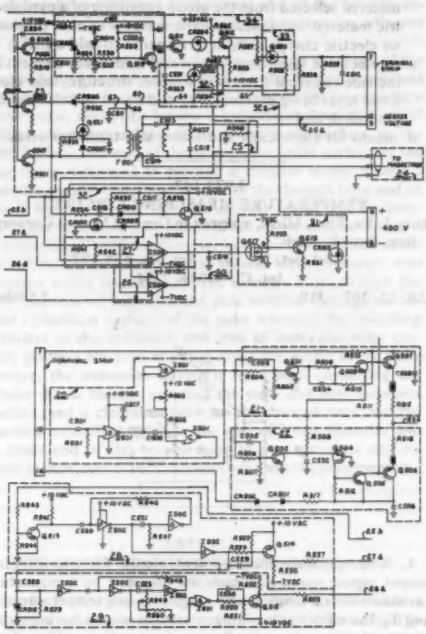
3,973,145

WEATHER RADAR TRANSISTORIZED PULSE MODULATOR

Jerry C. Schmitt, Spring Hill, and Terry K. Michie, Olathe, both of Kans., assignors to King Radio Corporation, Olathe, Kans.

Filed Jan. 14, 1974, Ser. No. 432,860
Int. Cl.² H03K 5/12; H03F 1/36; H03K 1/14
U.S. Cl. 307—263 2 Claims

1. In the modulator portion of a transmitter for a weather radar system utilized in aircraft, the improvement comprising:
   a trigger input to said modulator,
   an RF pulse producing means,
   means for driving said RF pulse producing means in accordance with said trigger input,
   circuit means interconnecting said trigger input with said pulse producing means,
   said driving means being operable to drive said RF pulse producing means with a pulse signal,
   means interconnected with said driving means for controlling the slope of said pulse signal utilized in driving said RF pulse producing means,
   said slope controlling means including a pulse current detector circuit connected with said driving means,
   integrator means interconnected with said detector circuit for producing a signal corresponding to the slope of said pulse signal utilized in driving said RF pulse producing means, and



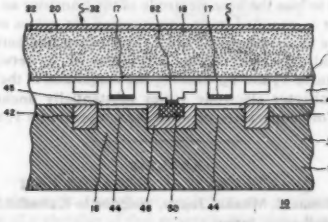
means interconnecting said integrator means and said driving means to control said driving in accordance with the signals from said integrator means.

3,973,146

SIGNAL DETECTOR COMPRISING FIELD EFFECT TRANSISTORS

Emil Arnold, Tarrytown; Merton H. Crowell, Mahopac, and Edward H. Stupp, Spring Valley, all of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 451,782, March 18, 1974, abandoned, which is a continuation of Ser. No. 322,633, Jan. 11, 1973, abandoned. This application Sept. 17, 1975, Ser. No. 614,928
Int. Cl.² H01L 29/78, 29/84, 27/10, 27/02
U.S. Cl. 357—26 12 Claims



1. A signal detector for detecting a signal comprising:
   a. a support structure comprising a semiconductor substrate containing an array of field-effect transistors individually comprising a channel region and a gate electrode disposed at said channel region;
   b. a transducer element disposed on said support structure and electrically coupled with said gate electrodes of said

transistor array, said transducer element consisting of a material selected from the group consisting of a pyroelectric material and a piezoelectric material so as to produce an electric charge pattern in response to said signal;

c. an electrode layer disposed on said transducer element at the side removed from said support structure, said electrode layer being permeable to said signal and electrically grounded; and

d. means for electrically addressing said transistor array.

3,973,147

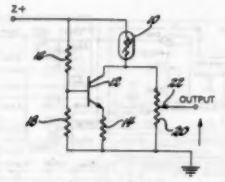
TEMPERATURE MEASURING CIRCUIT

Ruey J. Yu, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 28, 1975, Ser. No. 626,192

Int. Cl.² G01K 7/24

U.S. Cl. 307—310 **2 Claims**



1. A temperature measurement circuit for providing an output signal varying linearly in response to temperature variations over a temperature range between temperatures T_1 and T_2, the circuit comprising: a voltage source having a pair of output terminals and effective to supply a voltage V; a transistor having base, emitter and collector electrodes; a thermistor coupled between the collector electrode and one terminal of the voltage source, the thermistor having a resistance R_t varying exponentially as a function of the temperature sensed by the thermistor; a resistor having a resistance R_x coupled between the emitter electrode and the other one of the terminals of the voltage source, the quantity

$$V\,((k + R_x)/(k + R_x + R_t))$$

being substantially linear as a function of temperatures sensed by the thermistor between the temperatures T_1 and a temperature T_3 intermediate the temperatures T_1 and T_2 and being nonlinear as a function of temperatures sensed by the thermistor between the temperatures T_3 and T_2, where k is a constant equal to the voltage between the collector and emitter electrodes divided by the collector electrode current when the transistor is operated in its linear region; and bias means effective to bias the base electrode of the transistor so that the transistor is operated in its linear region for values of R_t between the temperatures T_1 and T_3 and is operated between its linear and saturated regions for values of R_t between the temperatures T_3 and T_2, whereby the magnitude of the voltage at the collector electrode varies substantially linearly as a function of temperature between the temperatures T_1 and T_2.

3,973,148

QUARTZ CRYSTAL VIBRATOR UNIT

Shojiro Komaki, Mitaka, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

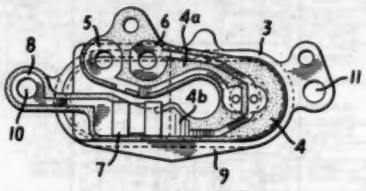
Filed Aug. 30, 1974, Ser. No. 502,186

Claims priority, application Japan, Aug. 31, 1973, 48-102221[U]

Int. Cl.² H01L 41/04

U.S. Cl. 310—8.9 **4 Claims**

1. A quartz crystal vibrator unit for use in a timepiece and the like comprising: a case; a quartz crystal vibrator sealed in said case and having a given resonant frequency; a printed circuit board mounted on said case and containing electric circuitry which terminates in no more than three terminals to enable connection to other circuitry, said printed circuit board having a generally forked shape with two forks, one fork extending along in contact with a surface portion of said case and containing one of said three terminals, and the other fork extending in spaced relationship from said case in the same general direction as said one fork and containing the remaining two of said three terminals; a condenser mounted on said



one fork of said printed circuit board and having a capacitance value chosen to compensate for deviation of the quartz crystal vibrator resonant frequency from a predetermined reference frequency; and means electrically connecting said quartz crystal vibrator and said condenser to said electric circuitry of said printed circuit board to thereby define a compact quartz crystal vibrator unit having a resonant frequency compensated to said predetermined reference frequency.

3,973,149

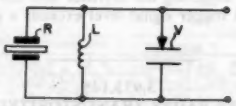
DEVICES USING PIEZOELECTRIC Tl_3BX_4 COMPOUNDS

Christopher R. Vale, Elkridge, Md., and Thelma J. Isaacs, Murrysville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 10, 1975, Ser. No. 540,195

Int. Cl.² H01L 41/18

U.S. Cl. 310—9.5 **33 Claims**



1. A crystal resonator comprising:

A. a single crystal of the approximate composition Tl_3BX_4 within about ±5% of stoichiometric, having two parallel surfaces, where B is selected from the group consisting of vanadium, niobium, tantalum, and mixtures thereof, and X is selected from the group consisting of sulfur, selenium, and mixtures thereof, and

B. an electrode mounted on each surface.

3,973,150

RECTANGULAR, ORIENTED POLYMER, PIEZOELECTRIC DIAPHRAGM

Masahiko Tamura; Kiyonori Iwama, and Toshikazu Yoshimi, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 12, 1975, Ser. No. 549,340

Claims priority, application Japan, Feb. 18, 1974, 49-19527[U]

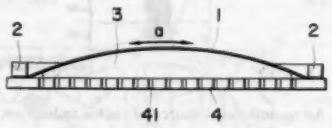
Int. Cl.² H01L 41/04

U.S. Cl. 310—9.5 **8 Claims**

1. A piezoelectric electro-acoustic transducer comprising: a piezoelectric diaphragm made of a high polymeric resin having its molecules uniaxially oriented, said diaphragm

having a great anisotropy in the plane thereof and being of an elongate shape having a length dimension greater than its width dimension;

a support means conforming in plan to said diaphragm such that its length correspondingly exceeds its width, such support means including a rigid perforate base plate behind said diaphragm, a resilient foam backing member sandwiched between the major central areas of said diaphragm and base plate in fixed relation to said base plate, and at least one opposed pair of elongate, stiff fixing



members along opposed edges of said diaphragm for fixing said diaphragm edges with respect to said base plate;

the resultant vector of the piezoelectric constants in the plane of said diaphragm being parallel to the diaphragm and support means width dimension and substantially perpendicular to the diaphragm and support means length dimension, for improved electro-acoustic conversion efficiency particularly in the low frequency range of the transducer.

3,973,151

STATOR ASSEMBLY FOR A DYNAMOELECTRIC MACHINE AND METHOD OF MANUFACTURING SAME

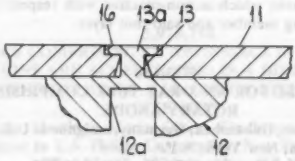
Roy Price Bowcott, Solihull, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed July 23, 1974, Ser. No. 490,941

Claims priority, application United Kingdom, July 25, 1973, 35431/73

Int. Cl.² H02K *15/02*

U.S. Cl. 310—42 **2 Claims**



1. A method of manufacturing a stator assembly for a dynamo electric machine of the type having a hollow cylindrical yoke member and a pole member supported on the inner cylindrical surface of the yoke member, comprising the steps of starting with a yoke member having a circular bore of uniform diameter and inner and outer ends, and a pole member with an upstanding integral circular extension of a uniform diameter less than the diameter of the cylindrical bore, deforming only the outer end of the cylindrical bore for defining a circular recess having a diameter greater than the diameter of the bore and simultaneously providing an area of lesser diameter than the circular recess and the inner end of the bore by the material displaced in defining the circular recess while retaining the original diameter of the bore between said area and the inner end of the bore, inserting the extension of the pole member into the bore from the inner end thereof such that the pole member lies against the inner cylindrical surface of the yoke whereby the diameters of the extension and said area correctly position the pole member along the length of the yoke member, deforming the free end of the extension to provide a rivet head occupying the circular recess thereby securing the pole member and yoke member together, and maintaining a clearance between the extension and the bore extending from said area to the inner end of the bore to accommodate any increase in diameter of the extension adjacent the pole member.

2. A stator assembly for a dynamo electric machine of the type including a hollow cylindrical yoke having inner and outer surfaces and a pole member carried on the inner surface of the yoke, said yoke having a cylindrical through bore of uniform diameter extending from the inner surface to the outer surface, the end of the bore at the outer surface of the yoke being deformed to provide a circular recess having a diameter greater than the diameter of the through bore and an area of lesser diameter than the circular recess and the inner end of the bore, said pole member having an integral cylindrical extension of uniform diameter less than the diameter of the through bore and matching said area of lesser diameter, said extension being inserted into the through bore through the inner end thereof such that the pole member lies against the inner cylindrical surface of the yoke whereby the matching diameters of the extension and area of lesser diameter correctly position the pole member along the length of the yoke member, the extension having a rivet head occupying the circular recess thereby securing the yoke and pole members together, and a clearance between the through bore and the extension extending between the area of lesser diameter and the inner end of the bore serving to accommodate any increase in diameter of the extension adjacent the pole member.

3,973,152

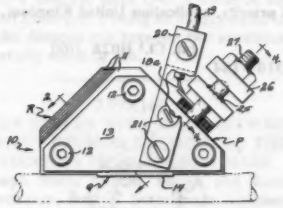
ULTRASONIC TRANSDUCER WITH LAMINATED COUPLING WEDGE

Henry H. B. Karplus, Hinsdale, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 3, 1975, Ser. No. 565,020

Int. Cl.² H01L *41/08*

U.S. Cl. 310—8.3 **9 Claims**



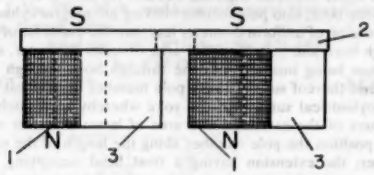
1. An ultrasonic transducer including a coupling wedge consisting of a plurality of thin generally triangular laminae of a corrosion and temperature-resistant material, means for holding the laminae together under pressure, means for directing ultrasonic waves into said coupling wedge through one of the edges of said coupling wedge and into a work piece located at a second edge, the third edge being constructed and arranged to direct ultrasonic waves reflected from the interface between the coupling wedge and the work piece across interfaces between the laminae.

3,973,153

ROTOR FOR AN ELECTRONICALLY CONTROLLED MICROMOTOR

Jean-Claude Berney, Chemin des Croix-Rouges 3, Lausanne, Switzerland

Filed Feb. 3, 1975, Ser. No. 546,981
Claims priority, application Switzerland, Feb. 7, 1974, 1676/74
Int. Cl.² H02K 21/12
U.S. Cl. 310—156 10 Claims



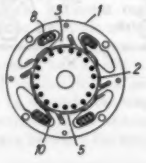
1. A rotor for a micromotor comprising an axle, and two juxtaposed plates of ferromagnetic material secured on said axle, at least one of said plates including a plurality of angularly spaced permanent magnets secured thereon and extending axially from said one plate, said magnets being axially magnetized and of the same polarity, the other of said plates including poles of ferromagnetic material axially aligned with said permanent magnets on said one plate and in spaced relation therewith, and means mounting said plates on said axle for permitting said one plate to be separately magnetizable in a unidirectional magnetic field after mounting said magnets thereon and before assembling the two plates on said axle.

3,973,154

ELECTRIC MOTORS

Alexander Richard William Broadway; William Fong, and Gordon Hindle Rawcliffe, all of Bristol, England, assignors to National Research Development Corporation, England

Filed Dec. 30, 1974, Ser. No. 537,348
Claims priority, application United Kingdom, Jan. 4, 1974, 415/74
Int. Cl.² H02K 3/00
U.S. Cl. 310—184 6 Claims



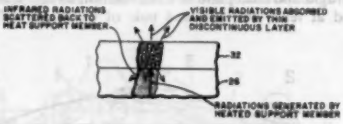
1. A two-speed, single-phase alternating current, shaded-pole, induction motor of the pole-amplitude modulation pole-changing type, providing alternative running pole-numbers in a ratio other than 2:1, including a stator formed with an even number of salient poles, said stator having a stator winding comprising a number of coils less, by an even number, than the lower of said alternative pole-numbers, pole-changing being effected by reversal, in current-carrying sense, of one half the number of said coils.

3,973,155

INCANDESCENT SOURCE OF VISIBLE RADIATIONS

Roger W. Warren, and Donald W. Feldman, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 31, 1975, Ser. No. 546,058
Int. Cl.² H01J 1/15
U.S. Cl. 313—218 7 Claims


INFRARED RADIATIONS SCATTERED BACK TO HEAT SUPPORT MEMBER
VISIBLE RADIATIONS ABSORBED AND EMITTED BY THIN DISCONTINUOUS LAYER
32
26
RADIATIONS GENERATED BY HEATED SUPPORT MEMBER

1. An incandescent source of visible radiations, said source comprising:

a. a refractory material supporting member, and means for heating said supporting member to a high temperature;

b. a thin refractory material layer overlaying said supporting member, means for heating all of said thin layer to an incandescent state, the material of said thin layer when in an incandescent state having an absorptivity in the visible region of the spectrum which very substantially exceeds its absorptivity in the infrared region of the spectrum, the physical structure of said thin layer exhibiting a plurality of spaced minute optical discontinuities, the average spacing between successive discontinuities in said thin layer structure being such that visible radiations propagated in said thin layer are substantially absorbed before traversing the distance from one discontinuity to the next succeeding average-spaced discontinuity and infrared radiations propagated in said thin layer are minimally absorbed while traversing the distance from one discontinuity to the next succeeding average-spaced discontinuity, and said thin layer having a thickness exceeding by at least several times the average spacing between successive discontinuities in said thin layer structure; and

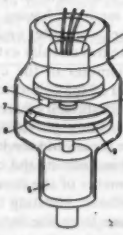
c. protective radiation-transmitting means surrounding said supporting member and said thin layer and enclosing an environment which is non-reactive with respect to said supporting member and said thin layer.

3,973,156

ANODE DISC FOR AN X-RAY TUBE COMPRISING A ROTARY ANODE

Peter Schreiber, Halstenbek, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 27, 1974, Ser. No. 536,837
Claims priority, application Germany, Jan. 23, 1974, 2403015; Feb. 5, 1974, 2405334
Int. Cl.² H01J 35/08
U.S. Cl. 313—330 2 Claims



1. An anode for a rotary anode X-ray tube, comprising a one-piece disc defining on a surface portion thereof an annular focal path, and a pair of annular grooves provided in said

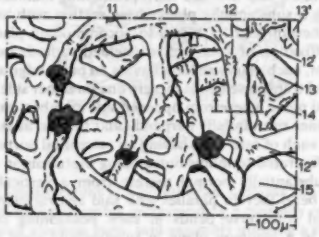
disc in proximity to and concentrically with respective sides of said path.

3,973,157

CHARGED-PARTICLE TRAPPING ELECTRODE

Tiziano A. Giorgi, and Paolo della Porta, both of Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy

Filed Jan. 7, 1975, Ser. No. 539,101
Claims priority, application Italy, Jan. 7, 1974, 19141/74
Int. Cl.² H01J 1/02, 1/14, 1/38, 1/48
U.S. Cl. 313—353 6 Claims



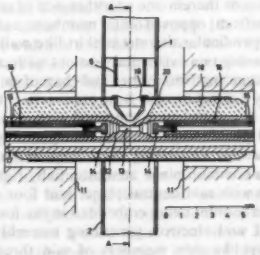
1. A charged particle accelerating or storage device in which at least a part of one electrode maintained at a positive potential comprises a section of high thermal conductivity connected to a charged-particle collecting body, the charged-particle collecting body comprising a 3-dimensional network defining a multiplicity of interconnecting free cells, the 3-dimensional network being made of a material selected from the group of a metal or an alloy of graphite, nickel, chromium, iron, titanium, tungsten, cobalt, and molybdenum, the three-dimensional network having dimensions selected to permit a major portion of charged particles incident on the charged-particle collecting body to penetrate a multiplicity of free cells before impinging on the material of the three-dimensionl network.

3,973,158

DEVICE COMPRISING AN ION SOURCE IN WHICH THE IONS ARE ACCELERATED IN A DIRECTION PERPENDICULAR TO A MAGNETIC FIELD OF HIGH INTENSITY

Adrianus Martinus Maria Otten, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 8, 1974, Ser. No. 468,193
Claims priority, application Netherlands, May 15, 1973, 7306714
Int. Cl.² H05H 7/08, 13/00
U.S. Cl. 313—362 6 Claims



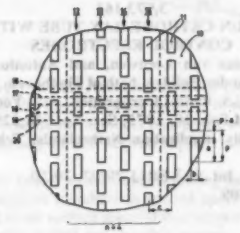
1. An ion source structure comprising a tubular anode provided with an ion exit aperture; means for establishing a magnetic field parallel to the axis of said anode, means for supplying ionizable gas into said anode; at least one cathode supported within said anode; an insulating layer covering the outer surface of said anode; a screen supported by said insulating layer and surrounding the curved outer surface of said anode; and an extractor electrode mounted on and passing through said screen opposite said exit aperture to accelerate the ions from exit aperture in a direction perpendicular to that of the magnetic field.

3,973,159

CATHODE-RAY TUBE FOR DISPLAYING COLORED PICTURES

Piet Gerard Joseph Barten, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 22, 1974, Ser. No. 435,531
Claims priority, application Netherlands, Feb. 21, 1973, 7302367
Int. Cl.² H01J 29/07, 31/20
U.S. Cl. 313—403 1 Claim



1. A cathode-ray tube for displaying coloured pictures comprising, in an evacuated envelope, means to produce at least two electron beams, a display screen comprising at least two patterns of regions luminescing in different colours, and a colour selection electrode comprising a plurality of substantially rectangular apertures which are arranged in substantially parallel rows, said apertures, measured in the direction of the rows, having substantially the same length a and substantially the same mutual pitch p, said rows being staggered relative to each other in n uniform steps over a distance equal to an integer number times p/n, n being an integer equal to or larger than 2, and the distance p-a between two apertures in a row being substantially equal to p/n.

3,973,160

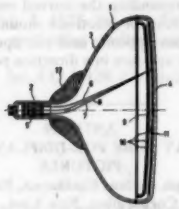
COLOR SCREEN WITH SPACE BETWEEN LUMINESCENT REGIONS PERVIOUS TO THERMAL RADIATION FROM SHADOW MASK

Constant Joseph Maria Geenen, Kenya, and Roelof Egbert Schuil, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 493,777, Aug. 1, 1974, abandoned.
This application Oct. 23, 1975, Ser. No. 625,121
Claims priority, application Netherlands, Aug. 3, 1973, 7310738
Int. Cl.² H01J 29/30, 29/07
U.S. Cl. 313—408 1 Claim

1. A color cathode ray tube comprising, in an evacuated envelope having a transparent face plate, means to generate a number of electron beams; a color selection electrode located opposite said face plate and having a plurality of apertures, a display screen provided on said face plate and including a plurality of discrete regions which luminesce at different colors, said electron beams being each associated with the luminescent regions of one color through the assigned apertures of said color selection electrode, said luminescent regions being each smaller or narrower than the corresponding

apertures and individually covered with electron permeable, light reflecting metal, and the regions of the face plate between said luminescent regions being pervious to ambient



light and thermal radiation, said color selection electrode being treated for improved thermal radiation and ambient light absorption.

3,973,161

PLURAL GUN CATHODE-RAY TUBE WITH OVAL CONTROL ELECTRODES

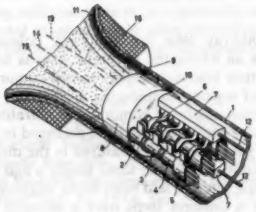
Johannes Aloysius van Leeuwen, and Antonius Wilhelmus Franciscus van der Heijden, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 10, 1975, Ser. No. 548,529

Claims priority, application Netherlands, Feb. 22, 1974, 7402421

Int. Cl.² H01J *29/02, 29/50*

U.S. Cl. 313—409 **6 Claims**



1. A cathode-ray tube for displaying color pictures having, in the neck portion of its envelope, means to generate a plurality of electron beams located in a single plane passing through the longitudinal axis of the tube, said means comprising, for each electron beam, a substantially cylindrical cathode body, a first conductive sleeve coaxially surrounding said cathode body and being connected thereto, a second conductive sleeve surrounding said first sleeve and being secured thereto by an electrically insulating member, and an outer, beaker-like control electrode surrounding said second sleeve and being in contact therewith, said second sleeve and said control electrode having respectively, an oblong cross-section the longer axis of which is perpendicular to said single plane.

3,973,162

CATHODE SUPPORT MEANS FOR A CRT ELECTRON GENERATING ASSEMBLY

Floyd Keith Collins, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

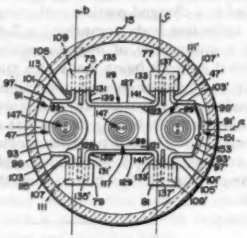
Filed Sept. 2, 1975, Ser. No. 609,347

Int. Cl.² H01J *29/50, 29/82*

U.S. Cl. 313—417 **4 Claims**

1. An improvement in a plural beam cathode ray tube electron generating assembly incorporating an in-line arrangement of a center electron gun flanked by first and third electron guns, each having an individual axis oriented in a common central plane, said assembly utilizing four spatially related longitudinal glass rod-like members arranged as pairs on either side of said central plane to support the plurality of electrode elements forming each of said in-line electron guns, wherein each gun includes an apertured cup-like control electrode and a separate spatially associated metallic construction embodying a shielded cathode assembly, said improvement relating to means for supporting the respective shielded cathode assemblies in said in-line electron guns comprising: substantially similar first and third cathode positioning members

for supporting each of said first and third shielded cathode assemblies, said first and third positioning members each having a substantially planar base section with an aperture therethrough of a size to accommodate placement and affixation of a respective shielded cathode assembly therein, each planar section having an outer edge and two parallel transverse bends therein one on either side of said central plane wherefrom opposed side members extend in a manner substantially perpendicular thereto as skirt-like walls, each of said walls having an extremital portion with a configurated terminus outstanding therefrom in a manner substantially normal thereto from a vertical transverse bend therein parallel with said central plane, said vertical transverse bends in each positioning member being in a common plane in substantially right angular relationship with said central plane wherealong said termini extend outwardly in an opposed manner being em-



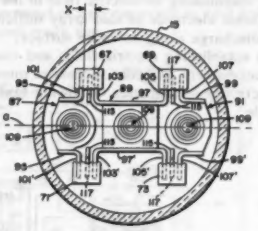
bedded in a respective member of each pair of said glass support members; and

a center cathode positioning member for supporting said center shielded cathode assembly, said center cathode positioning member having a substantially planar base section with an aperture therethrough of a size to accommodate placement and affixation of said center shielded cathode assembly therein, said center planar section being oriented in a plane substantially common with said planar base sections of said first and third positioning members, said center planar section having two parallel transverse bends therein one on either side of said central plane wherefrom opposed side members extend in a manner perpendicular thereto as skirt-like walls, each of said walls having two extremital portions with configured termini outstanding from either end thereof in a manner substantially normal thereto from two vertical transverse bends therein parallel to said central plane, each end of said central positioning member having two of said extremital portions emanating therefrom in an opposed manner in a common plane at substantially right angular relationship with said central plane, said four extending configurated termini being embedded in the four support members of said electron generating assembly; the respective skirt-like side members of said three cathode positioning members being oriented in common parallel planes with said in-line gun arrangement to provide cooperating side shielding effects at the rear of said electron gun assembly.

3,973,163
HEATER SUPPORT POSITIONING IN A CRT ELECTRON GENERATING ASSEMBLY

Floyd Keith Collins, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sept. 2, 1975, Ser. No. 609,348
Int. Cl.² H01J *29/50, 29/82*
U.S. Cl. 313—417 **3 Claims**



1. An improvement in a plural beam cathode ray tube electron generating assembly incorporating a plurality of structurally related electron guns, said assembly utilizing a plurality of spatially oriented longitudinal glass rod-like members arranged to support the several electrode elements forming each of said electron guns, wherein said assembly includes a plurality of separate metallic shielded cathode assembly positioning members having outstanding extremital portions wherefrom configurated termini extend in a common plane, each of said rod-like supporting members having embedded therein a terminus of each of two adjacent cathode assembly positioning members in a spatially related side-by-side manner, each of said cathodes having a separately supported individual heating element oriented therein, said improvement relating to discretely positioned heater support means comprising:

a plurality of planar, strap-like heater support members each having a terminally contoured planar projection portion embedded in each of said rod-like members in substantially the plane of embedment of the termini of said cathode positioning members, each of said planar projection portions being embeddingly oriented in the intervening area between the side-by-side embedment of the respective related termini of two of said cathode assembly positioning members to effect improved individual embedment of each heater support member in a respective glass supporting member.

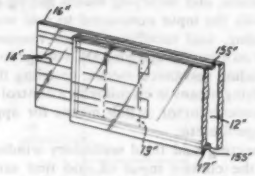
3,973,164
GASEOUS DISCHARGE DISPLAY DEVICE HAVING SPECIFIC STANDARDIZED VISUAL SHAPES TO FORM ALPHA-NUMERIC DISPLAY

James F. Nolan, Sylvania; Theodore C. Baker, Toledo; Wolfgang W. Bode, Sylvania; Richard G. Mathias, and Lawrence V. Pfaender, both of Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 163,043, July 15, 1971, Pat. No. 3,746,420, which is a division of Ser. No. 783, Jan. 5, 1970, Pat. No. 3,614,511, which is a division of Ser. No. 686,384, Nov. 24, 1967, Pat. No. 3,499,167. This application Dec. 3, 1971, Ser. No. 204,470
Int. Cl.² H01J *11/02*
U.S. Cl. 313—518 **1 Claim**

1. A gas discharge display panel system for displaying characters comprised of numerals, letters and words comprising in combination, a first rigid inorganic nonconductive support member, a first plurality of continuous conductor members formed in situ and spaced apart relation on an inner surface of said first rigid nonconductive support member, said first plurality of conductor members being specific standardized visual shapes arranged on said first nonconductive support member and a pattern such that selective activation thereof constitutes numerals, letters and words, a layer consisting essentially of a heat resistant inorganic dielectric material formed in situ on at least all surfaces of said first plurality of conductor members except the ends thereof and on the surface of said first support member surface therebetween,

a second rigid inorganic nonconductive support member having an inner surface area facing the inner surface area of said first rigid nonconductive support member, a plurality of second continuous conductor members formed in situ on said inner surface of said second rigid nonconducting support member and in opposed cooperating relationship with respect to the conductors on said first nonconductive support member to define therewith a plurality of gaseous discharge points,



a second layer of heat resistant inorganic dielectic material formed in situ on at least all surfaces of said second plurality of conductor members except the ends thereof and on the surface of said second support member therebetween,

an inorganic spacer sealant means joining said first and said second support members in spaced apart relation define with said inner surface areas of said support members thin hermetically sealed gas chamber means,

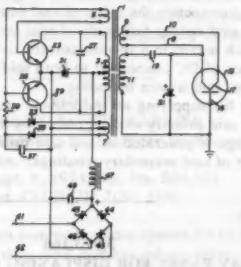
an ionizable gaseous medium within said thin gas chamber,

and means for applying exciting potentials to selected ones of the conductors on said first and said second inorganic nonconductive support members to generate selected numerals, letters and words according to the shapes of the selected conductors.

3,973,165
POWER SUPPLY FOR A MICROWAVE MAGNETRON

Thomas Eugene Hester, Fort Wayne, Ind., assignor to Litton Systems, Inc., Huntington, Ind.

Filed Apr. 28, 1975, Ser. No. 572,105
Int. Cl.² H03B *9/10*
U.S. Cl. 315—105 **11 Claims**



1. In combination:

a transformer, said transformer having a core of ferrite magnetic material with said core having a gap of nonmagnetic material between ferrite portions thereof,

a primary winding,

a first high voltage secondary winding,

a second low voltage secondary winding,

a third low voltage secondary winding,

a fourth low voltage secondary winding, with said windings located on said ferrite core;

said primary winding having a predetermined electrical inductance characteristic and having first and second winding ends and a center tap connected to essentially the middle of said primary to thereby divide said primary into first and second primary winding halves;

first and second semiconductor switch means, each of said switch means having a control input and a pair of output terminals for providing a low impedance current conducting circuit between the output terminals during the interval in which a suitable control voltage is present at the said control input thereof;

rectifying means, said rectifying means having an input and output, with the input connected to said second secondary winding, said rectifying means responsive to AC voltage at an input for applying DC voltage to its output;

means, including resistance means, coupling the output of said rectifying means in circuit with a control input of one of said semiconductor switch means for applying a DC bias voltage thereto;

means connecting said third secondary winding in circuit between the control input of said first semiconductor switch means and the control input of said second semiconductor switch means for applying any Ac voltage appearing thereacross said winding to said control inputs in an opposite phase relationship, whereby a suitable control voltage is applied to the control inputs of said switch means one-at-a-time during each cycle of AC voltage;

a magnetron for generating microwave frequency energy, said magnetron having a heater-cathode and an anode;

means coupling said fourth secondary winding in circuit with said heater cathode of said magnetron for applying high frequency low voltage AC from said winding to said heater;

a rectifier diode having an anode and cathode;

means connecting said rectifier diode in circuit across said magnetron with the cathode end thereof connected to the magnetron anode for permitting the diode to conduct current when the polarity of voltage thereacross is of one polarity and permitting the magnetron to conduct current when the voltage thereacross is of the opposite polarity;

first capacitor means;

means connecting said first high voltage secondary winding, said capacitor means, and said parallel combination of rectifying diode and magnetron in an electrical series circuit;

means connecting one of said primary winding halves and said output terminals of said first semiconductor switch means in a first current conducting path;

means connecting the other of said primary winding halves and said output terminals of said second semiconductor switch means in a second current conducting path; and

a source of DC connected to both said current conducting paths, said source including:

means for supplying an inductively smoothed DC current into said primary winding, whereby a high frequency AC voltage is generated across said primary winding and in each of said secondary windings.

3,973,166

DISPLAY PANEL FOR DISPLAYING BARS OF LIGHT

Thomas C. Maloney, Bernardsville, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 428,126, Dec. 26, 1973, abandoned. This application Jan. 17, 1975, Ser. No. 542,130

Int. Cl.[2] H05B *37/00*

U.S. Cl. 315—169 TV **41 Claims**

1. A gas discharge display panel for displaying at least one bar of light of variable length comprising

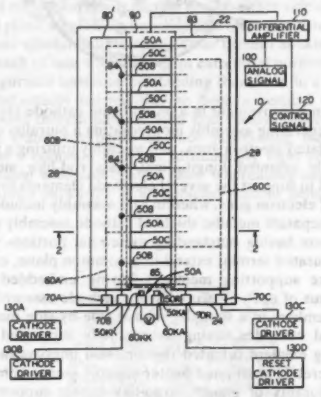
a gas-tight envelope including a viewing window and containing ionizable gas at a pressure capable of sustaining a cathode glow,

a substrate of insulating material having one surface facing said viewing window,

a succession of cathode electrodes disposed closely adjacent one another in a linear array along said substrate surface,

means for establishing an electric field in the region of the first cathode electrode of said array sufficient to initiate a glow discharge along its entire surface,

means for establishing electric fields and causing cathode glow, successively, adjacent successive ones of said cathode electrodes in sequence, following said first cathode electrode,



each such cathode electrode turning on and exhibiting cathode glow, as said electric field is established adjacent to it, only when it is adjacent a cathode electrode which is glowing, and the glow of each such cathode electrode combining with the glow of the preceding adjacent cathode electrode to form an apparently continuous bar of glow visible through said viewing window, and

means including a single anode electrode extending along said entire succession of cathode electrodes, and responsive to an electrical signal applied between said anode and different groups of said cathodes for controlling the number of such cathode electrodes in such groups adjacent which a glow discharge is produced, in accordance with the period of time the electric signal is applied, so that the length of the bar of glow produced by such groups of cathodes represents a characteristic of such applied signal.

3,973,167

SPARK SOURCES WITH ELECTRONIC SWITCHING TUBES

John P. Walters, Madison, Wis., and John A. Bernier, Lexington, Mass., assignors to Wisconsin Alumni Research Foundation, Madison, Wis. and Fisher Scientific Company, Pittsburg, Pa.

Continuation-in-part of Ser. No. 445,318, Feb. 22, 1975, abandoned. This application Apr. 16, 1975, Ser. No. 568,577

Int. Cl.[2] H05B *37/00*

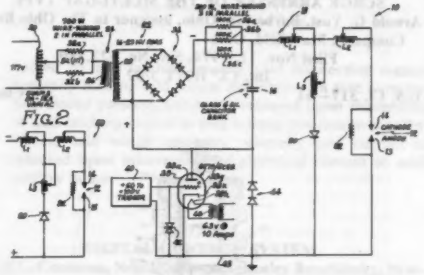
U.S. Cl. 315—207 **27 Claims**

16. A spark source,

comprising a spark gap having a grounded electrode and an ungrounded electrode,

a capacitor adapted to be discharged across said spark gap,

said capacitor having positive and negative terminals adapted to be charged positively and negatively,
a power supply for charging said capacitor,
said power supply having positive and negative terminals connected to said positive and negative terminals of said capacitor,
a discharge circuit connected between said capacitor and said spark gap,
said discharge circuit including means for connecting said positive terminal of said capacitor to said grounded electrode of said spark gap,

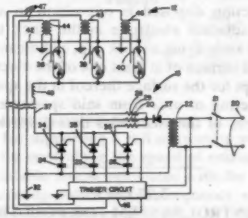


said discharge circuit including first and second inductive elements connected in series with said spark gap,
and shunting diode means including a shunting diode and connected across the series combination of said spark gap and said second inductive element,
said shunting diode being polarized the same as the polarization of said capacitor and thereby being forward biased and conductive during the first half cycle of the capacitor discharge current,
whereby said shunting diode splits current away from said spark gap during said first half cycle.

3,973,168
WIRING CIRCUITS AND METHOD FOR MULTIPLE FLASH-BEACONS

Wayne A. Kearsley, Chelmsford, Mass., assignor to Flash Technology Corporation of America, Nashua, N.H.

Filed June 16, 1975, Ser. No. 587,336
Int. Cl.² G08G *5/00*; **H05B** *41/34*
U.S. Cl. 315—232 **7 Claims**

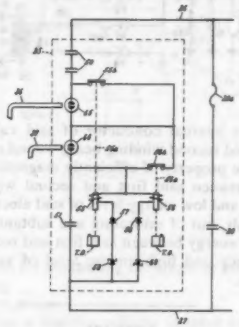


1. Flashlamp apparatus for flashing a plurality of flashlamps substantially simultaneously at a location remote from a capacitive discharge power source comprising:
a. a plurality of flashlamps;
b. a capacitive discharge power supply having capacitive storage sufficient to flash said plurality of flashlamps;
c. cables connecting said power supply to said plurality of flashlamps for carrying capacitive discharge current to flash said flashlamps and at least one of said cables connected to provide discharge current in common to said plurality of flashlamps; and,
d. a trigger circuit connected to trigger each of said plurality of flashlamps in rapid sequence such that the current through said at least one of said cables does not significantly exceed the maximum instantaneous current for flashing one flashlamp while said plurality of flashlamps have the appearance of flashing simultaneously.

3,973,169
OVERVOLTAGE PROTECTION FOR HIGH VOLTAGE SHUNT CAPACITOR BANKS

Charles H. Titus, Newtown Square, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Dec. 10, 1974, Ser. No. 531,410
Int. Cl.² H02H *7/16*
U.S. Cl. 317—12 B **7 Claims**



1. A shunt capacitor bank for connection between high voltage terminals of an alternating current electric power supply system comprising, a plurality of serially connected groups of capacitors connected in parallel circuit relation between pairs of paralleling buses, serially intermediate buses being common to serially adjacent groups of paralleled capacitors, an individual protective fuse connected in series with each said capacitor between adjacent buses defining a capacitor group, an impedance voltage divider connected in shunt circuit relation with each said capacitor group and including a measuring impedance defining a measuring potential small in proportion to voltage across the associated capacitor group, a pair of oppositely poled unilaterally conductive signal generating circuits connected across said measuring impedance, each said signal generating circuit including a voltage responsive discharge device operable to energize said circuit, said discharge devices being operable in response to different levels of abnormally high measuring potential, and control means separately responsive to energization of said signal generating circuits.

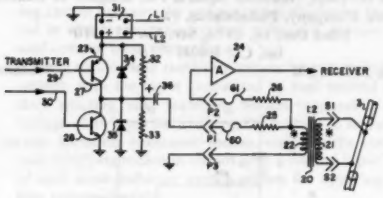
3,973,170
INTRINSIC SAFETY BARRIER

James A. Hogan, Hatfield, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 9, 1974, Ser. No. 504,451
Int. Cl.² H02H *7/20*, *3/20*
U.S. Cl. 317—16 **14 Claims**

1. For use in a data communications system for an industrial plant having hazardous and non-hazardous areas, the data communications system comprising a plurality of communications stations each of which generally is located in a non-hazardous area, said communications stations being interconnected by a coaxial cable that passes through at least one hazardous area, at least one of said communications stations being adapted to be energized from a source of alternating voltage of commercial frequency and being operative to produce for transmission over, and to receive from, said cable

electrical communications signals having frequencies substantially higher and an energy level substantially lower than the frequency and energy level, respectively, of said source, an intrinsic safety barrier coupling at least one of said stations to said cable in a manner limiting to a predetermined small value the level of energy that may be transmitted to said cable by said station, said barrier comprising a transformer having a first winding connected in circuit with said one station and an inductively coupled second winding connected between the



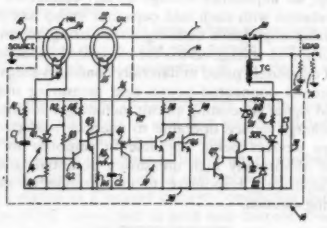
sheath and the internal conductor of said cable, said first winding and said second winding being wound on a magnetic core having the property of efficiently magnetically transferring energy between said first and second windings at the frequencies of and low energy level of said electrical communications signals, but of saturating and subtantially blocking the transfer of energy between said first and second windings at the frequency and high energy level of said alternating voltage source.

3,973,171

GROUND FAULT CIRCUIT INTERRUPTING DEVICE WITH GROUNDED NEUTRAL DETECTION

Edward Keith Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed May 19, 1975, Ser. No. 578,656
Int. Cl.² H02H *3/28*
U.S. Cl. 317—18 D **8 Claims**



1. A module for utilization in a ground fault circuit interrupting device wired into a power distribution circuit comprising at least one line conductor and a neutral conductor, said module comprising, in combination:

A. a differential current transformer including

1. a core in which is developed a magnetic flux occasioned by a current imbalance in the line and neutral conductors of the distribution circuit, and a secondary winding wound on said core;

B. an output element connected across said secondary winding for developing a signal voltage indicative of the magnitude of secondary current developed as a result of the current imbalance;

C. a normally conductive electronic switch connected across said secondary winding in shunt with said output element; and

D. a neutral transformer having a secondary winding for connection in series with the neutral conductor and a primary winding; and

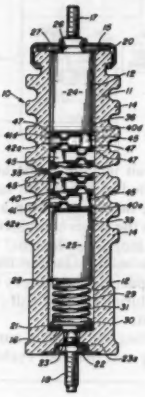
E. a pulse generator connected to supply a periodic pulse output through said primary winding of said neutral transformer to render said switch non-conductive for the interval of said pulse and thereby divert said secondary current through said output element pursuant to developing said signal voltage.

3,973,172

SURGE ARRESTER OF THE MULTI-GAP TYPE

Arnold G. Yost, Barberton, Ohio, assignor to The Ohio Brass Company, Mansfield, Ohio

Filed Nov. 11, 1974, Ser. No. 522,350
Int. Cl.² H01T *5/02*
U.S. Cl. 317—61 **19 Claims**



1. A surge arrester having a valve block, a gap assembly in series with the valve block and providing a plurality of spark gaps in series, said gap assembly comprising a plurality of aligned gap units disposed in a stack, each gap unit embodying two metallic disc electrodes having opposed surfaces, insulating spacer members interposed between adjacent electrodes for spacing the electrodes a predetermined distance from each other in the stack, at least one electrode of each gap unit having a projection disposed in opposition to a conductive surface of an adjacent electrode in the stack to provide a sparkover zone embodying a spark gap, and means for insulating the opposed surface of at least one of the electrodes in the gap units, except for the surface thereof in the sparkover zone whereby wandering of arcs from said sparkover zone onto adjacent surfaces of the electrodes during sparkover is prevented.

3,973,173

CURTAIN CONTROL SYSTEM FOR POULTRY HOUSES

Roman Oren Smith, Rte. No. 4 Box 508, Siler City, N.C. 27344

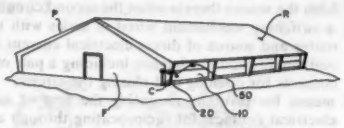
Filed Feb. 5, 1975, Ser. No. 547,175
Int. Cl.² E05F *15/20*
U.S. Cl. 317—142 TD **4 Claims**

1. A curtain release device for poultry houses of the type having an electrically operated ventilating system and side wall curtains normally held in an upper or closed position by a cable connecting the curtains and a winch assembly, said device comprising:

a. An electrical monitoring means for completing an electrical circuit responsive to interruption of electrical current to said poultry house;

b. a normally closed latching means connected to said monitoring means, said latching means being moved to a release position responsive to the completion of said electrical circuit; and

c. a connecting means having one end thereof attached to said winch assembly and the other end releasably connected to said latching means, said connecting means normally holding said winch assembly with said curtains in a closed position, but being released upon movement of said latching means to said release position to thereby release said winch assembly, whereby said curtain is released upon interruption of electrical current to said poultry house.



3,973,174

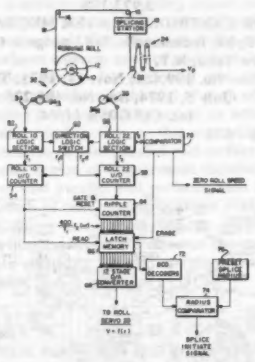
DIGITAL CONTROL SYSTEM

Boyd L. Corcoran, Newtonville, and Stanley Ronchinsky, Newton Centre, both of Mass., assignors to Butler Automatic, Inc., Canton, Mass.

Filed Dec. 26, 1974, Ser. No. 536,331

Int. Cl.² B65H *59/38*

U.S. Cl. 318—6 **7 Claims**



1. A web control system comprising

A. means for supporting a roll of running web,

B. means for controlling the speed of rotation of said roll,

C. first rotatable means associated with the support means for generating pulses whose frequency varies in accordance with the speed of said roll,

D. a fixed diameter roll around which web from the running roll is trained,

E. second rotatable means for generating pulses whose frequency is proportional to the speed of the fixed diameter roll,

F. a resettable first counter connected to receive and count the output pulses from the second pulse generating means,

G. means for applying the output pulses from the first pulse generating means to reset the counter so that the contents of the counter are indicative of the length of web having traveled over the fixed diameter roll during the time in which the roll of running web has rotated through a selected angle.

3,973,175

INDUCTION MOTOR SPEED CONTROL APPARATUS

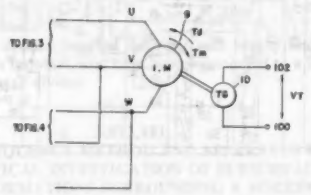
Nobuo Anzai, and Hiroshi Kamaike, both of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1973, Ser. No. 425,722

Claims priority, application Japan, Dec. 21, 1972, 47-128637

Int. Cl.² H02P *1/40*

U.S. Cl. 318—203 R **2 Claims**



1. Apparatus for controlling the speed of an induction motor comprising:

an induction motor,

a load having a negative polarity coupled to the induction motor,

means for generating a speed signal corresponding to the speed of the load,

means for generating a predetermined speed command signal,

adder circuit means for generating a difference signal between the speed signal corresponding to the speed of the load and the predetermined speed command signal,

amplifier circuit means with a delay characteristic for amplifying and delaying the difference signal,

the amplifier circuit means having a delay characteristic cancelling device,

means for energizing the delay characteristic cancelling device after the load is accelerated and for deenergizing the delay characteristic cancelling device at the deceleration starting point of the load,

the amplifier circuit means having an amplification character changing device,

means for energizing the amplification character changing device after the load is accelerated and for deenergizing the amplification character changing device at the deceleration starting point of the load,

a saturation signal generating circuit having an input connected to the output of the amplifier circuit means,

means for energizing the saturation signal generating circuit after the load is accelerated and for deenergizing the saturation signal generating circuit at the deceleration starting point of the load,

a distribution circuit having an input connected to the output of the saturation signal generating circuit and first and second outputs,

a turn-on control circuit for applying voltage to the induction motor during a power run mode and for applying rated voltage to the induction motor during the time the saturation signal generating circuit is energized having an input connected to the first output of the distribution circuit,

a turn-on control circuit for applying voltage to the induction motor during a DC braking mode having an input connected to the second output of the distribution circuit.

3,973,176

CONTROL CIRCUITS FOR ELECTRICALLY DRIVEN VEHICLES

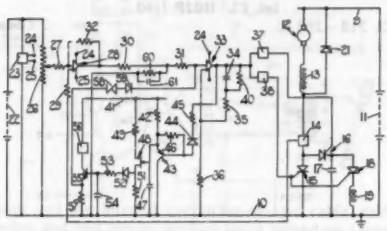
Ivor Carl Rohsler, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed June 5, 1974, Ser. No. 476,557

Claims priority, application United Kingdom, June 6, 1973, 27009/73

Int. Cl.² H02P 5/12

U.S. Cl. 318—269 **1 Claim**



1. A control circuit for an electrically driven vehicle comprising in combination a traction motor driving the vehicle, a thyristor chopper circuit controlling the speed of the traction motor, said chopper circuit including a main thyristor in series with the motor, and a commutating thyristor which when fired turns off the main thyristor, demand means controlling the instants of firing of the thyristors to regulate the mean current flow in the motor, said demand means setting a required current through said motor and firing the commutating thyristor when said required current is attained, said demand means including brake selection means arranged to operate the motor in a braking mode as well as in a normal drive mode, an overriding control permitting firing of said commutating thyristor when the main thyristor has been on for a predetermined time, timing means operable when the overriding control is operative for setting the minimum off period of the main thyristor, said timing means serving when the overriding control is operative to increase the normal minimum off period of said main thyristor, means for setting the normal minimum on and off period of the main thyristor, said timing means operating to increase the normal minimum off period only when the motor is being used to provide electrical braking.

3,973,177

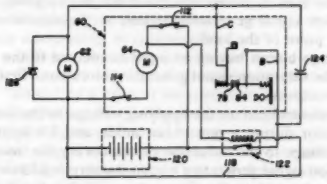
MOTOR SPEED CONTROL DEVICE

Louis A. Hausknecht, 4504 State Road, Cleveland, Ohio 44109

Continuation of Ser. No. 130,603, April 2, 1971, abandoned, which is a division of Ser. No. 769,177, Oct. 21, 1968, Pat. No. 3,581,177. This application Nov. 25, 1974, Ser. No. 526,783

Int. Cl.² H02P 5/10

U.S. Cl. 318—330 **9 Claims**



1. In combination:

a. a first electrical circuit, including a source of direct electrical current;

b. a first motor disposed in the first circuit and wired in series with the source therein and operable by current therefrom;

c. a second electrical circuit, including a source of direct electrical current;

d. a second motor disposed in the second circuit and wired in series with the source therein and operable by current from the source therein when the second circuit is closed;

e. a switching mechanism wired in series with the second motor and source of direct electrical current in the second circuit, said mechanism including a pair of electrical contacts for opening and closing the circuit;

f. means for pivotally mounting the first of said pair of electrical contacts for reciprocating through a predetermined arc;

g. means for mounting the second of said pair of electrical contacts for movement to and from the first reciprocable contact, to vary the dwell between said contacts;

h. means coacting with the first motor for reciprocating said first contact at least twice for every rotation of the shaft of said first motor, said means including (I) a rotor mounted on the shaft of the first motor for unitary rotation therewith, the rotor having at least two cam surfaces which are concentrically disposed about the longitudinal axis of the shaft of the first motor, and (II) a cam follower rideable on said cam surfaces for causing reciprocation of said first contact into and out of engagement with the second of said contacts as said cam follower rides on said cam surfaces; and

i. a capacitor disposed in the second circuit and wired in parallel with the switching mechanism, such that the capacitor is charged and discharged as the second circuit is opened and closed.

3,973,178

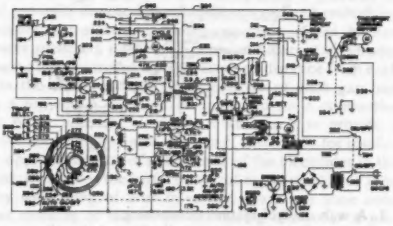
TAPE CARTRIDGE PLAYER MECHANISM

Gerald Dee Pyles, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 199,482, Nov. 17, 1971. This application July 5, 1974, Ser. No. 486,225

Int. Cl.² G05B 11/14

U.S. Cl. 318—673 **6 Claims**



1. An assembly comprising:

a gear;

a motor coupled to drive said gear to rotate;

a motor control circuit operable to control the energization of said motor;

a conductive pattern mounted to a major surface of said gear and connected in said motor control circuit, said conductive pattern including an outer conductive ring broken at one point and a series of inner notched portions spaced along said ring remotely from said point; and

a first contact engaging said notched portions in sequence and cooperating with said outer conductive ring for applying a voltage to said conductive pattern;

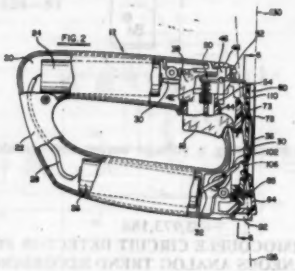
said motor control circuit being operative to cause said motor to be energized and drive said gear to rotate whenever said voltage is applied to said conductive pattern.

3,973,179

MODULAR CORDLESS TOOLS

Edwin Joseph Weber, and Ralph James Secoura, both of Baltimore, Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Filed Aug. 23, 1974, Ser. No. 499,961
Int. Cl.² B25F *3/00*; H01R *13/54*; H01M *10/46*;
U.S. Cl. 320—2 15 Claims



9. In a modular cordless power tool assembly including a power handle module and a tool head module each of said modules including facing end surfaces, said end surfaces being substantially parallel to one another when said modules are assembled and complementary means on each of said modules for mechanical and electrical coupling thereof to form a power tool, said complementary means being disposed within said facing end surfaces of said modules, the improvement wherein said complementary coupling means on each of said modules are aligned to provide for assembly of said modules in a first direction, said first direction being parallel to said facing end surfaces wherein each of said modules includes an external housing portion for enclosing said complementary coupling means, and wherein the end of each of said external covering housing portions is disposed at an acute angle relative to said assembly direction, so that assembly of said modules in the direction of said parallel end surfaces provides an elongated, stable region of engagement therebetween due to engagement of said parallel end surfaces, said angled disposition of said ends of said housing portions providing a space therebetween during assembly movement of said modules in said first direction to prevent interference thereof and providing a complete enclosure for said coupling means in the assembled position of said modules.

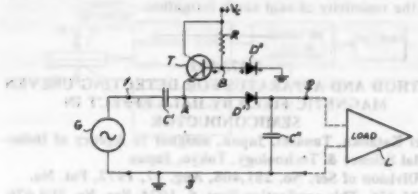
3,973,180

VOLTAGE BOOSTING DETECTOR CIRCUIT

Rinaldo Graziadei, Monza, and Marco Siligoni, Milan, both of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Agrate Brianza, Italy

Filed Oct. 30, 1975, Ser. No. 627,332
Claims priority, application Italy, Oct. 31, 1974, 29002/74
Int. Cl.² H02M *7/00*
U.S. Cl. 321—15 8 Claims

1. A voltage-boosting detector circuit comprising:
an input terminal and a common terminal connectable across a source of amplitude-modulated oscillations;
an output terminal connectable together with said common terminal across a load;
a series capacitor inserted between said input and output terminals;
a shunt capacitor inserted between said output and common terminals in cascade with said series capacitor;
a charging resistance for said shunt capacitor inserted between said series capacitor and said output terminal, said charging resistance and said series capacitor having a common junction point;
a transistor with a collector, an emitter and a base, said base being tied to said junction point;
a supply of driving voltage for said transistor connected to said collector; and



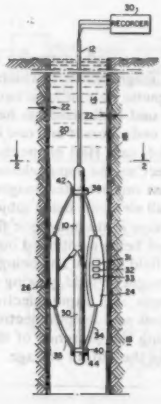
a voltage divider inserted between said supply and said common terminal, said base being connected to a tap on said voltage divider.

3,973,181

HIGH FREQUENCY METHOD AND APPARATUS FOR ELECTRICAL INVESTIGATION OF SUBSURFACE EARTH FORMATIONS SURROUNDING A BOREHOLE CONTAINING AN ELECTRICALLY NON-CONDUCTIVE FLUID

Thomas J. Calvert, Norwalk, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 19, 1974, Ser. No. 534,561
Int. Cl.² G01V *3/18*
U.S. Cl. 324—5 19 Claims



1. A method for investigating subsurface earth formations traversed by a borehole containing an electrically non-conductive fluid comprising:
passing a pad-mounted electrode system through the borehole, said electrode system having at least one current emitting electrode and at least one current return electrode;
producing a high frequency electrical signal;
coupling said high frequency electrical signal to said electrodes, the frequency of said high frequency signal being sufficiently high to couple said electrode to said formation to permit current to be emitted into the formation surrounding the borehole;
comparing the resistive and reactive components of the high frequency signal to produce a first signal dependent upon the phase difference between the resistive and reactive component;

using said first signal to automatically compensate for changes in at least the reactive component of said high frequency electrical signal; and

measuring at least one component of said high frequency electrical signal to produce an output signal indicative of the resistivity of said earth formation.

3,973,182

METHOD AND APPARATUS FOR DETECTING UNEVEN MAGNETIC FIELD BY HALL EFFECT IN SEMICONDUCTOR

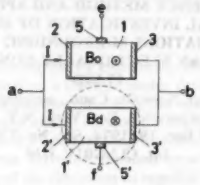
Shoei Kataoka, Tanashi, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Division of Ser. No. 281,408, Aug. 17, 1972, Pat. No. 3,835,376. This application Sept. 6, 1974, Ser. No. 504,676

Claims priority, application Japan, Aug. 20, 1971, 46-62929; Sept. 20, 1971, 46-72459

Int. Cl.² G01R *33/06*

U.S. Cl. 324—45 **18 Claims**



1. A method for electrically detecting an inverted magnetic field portion in a magnetic field which method comprises: disposing in a magnetic field at least two three-terminal Hall elements, each of said Hall elements having two input electrodes on opposite ends thereof and one Hall output electrode on one side thereof, said Hall elements being connected in parallel with respect to the input electrodes, said magnetic field having at least one inverted magnetic field portion, at least one of said Hall elements being subjected to said inverted magnetic field portion in the magnetic field at right angles, a second Hall element being positioned outside the path of said inverted magnetic field portion and being constantly subjected to the uninverted magnetic field, passing a current through the Hall elements across said input electrodes, measuring the output voltage across said output electrodes of said Hall elements, and detecting the presence of the inverted magnetic field by variation in the output voltage.

3,973,183

METHOD AND APPARATUS FOR DETECTING UNEVEN MAGNETIC FIELD BY A CHANGE IN RESISTANCE OF SEMICONDUCTOR ELEMENT

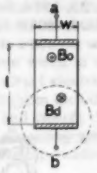
Shoei Kataoka, Tanashi, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Division of Ser. No. 281,408, Aug. 17, 1972, Pat. No. 3,835,376. This application Sept. 9, 1974, Ser. No. 504,674

Int. Cl.² G01R *33/02*

U.S. Cl. 324—46 **12 Claims**

1. A method for electrically detecting an inverted magnetic field portion in a magnetic field which method comprises: disposing in a magnetic field a semiconductor magneto-resistive element having two input electrodes on opposite ends of the element, said magnetic field having at least one inverted magnetic field portion positioning said magneto-resistive element in the path of said inverted magnetic field so that only one part of said element will be exposed to said inverted field portion in the magnetic field at right angles thereto, passing a current to the semiconductor element across said two electrodes, and measuring a voltage across the semiconductor element.



3,973,184

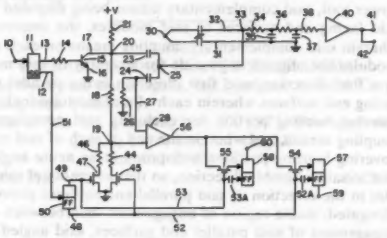
THERMOCOUPLE CIRCUIT DETECTOR FOR SIMULTANEOUS ANALOG TREND RECORDING AND ANALOG TO DIGITAL CONVERSION

Ervin T. Raber, Norristown, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed Jan. 27, 1975, Ser. No. 544,472

Int. Cl.² G01R *31/02*

U.S. Cl. 324—51 **7 Claims**



1. A thermocouple circuit condition detector for use at the input circuit of a thermocouple amplifier for amplifying the output of a thermocouple having one terminal of the thermocouple connected to the amplifier input and the other terminal of the thermocouple connected to circuit common and without removing said thermocouple circuit from said amplifier input, comprising:

a differential input comparator amplifier having a pair of input terminals and an output terminal,

a source of pulse signals having a pair of terminals, one of which is connected to circuit common,

first means for coupling the other of said pair of terminals of said source of pulse signals to said one terminal of the thermocouple which is connected to the amplifier input and to one of said pair of input terminals of said differential comparator amplifier to produce an amplifier input signal to said differential comparator responsive to the condition of said thermocouple circuit, and

second means for coupling a predetermined portion of the amplitude at said other of said pair of terminals of said source of pulse signals to the other of said pair of input terminals of said differential comparator amplifier to

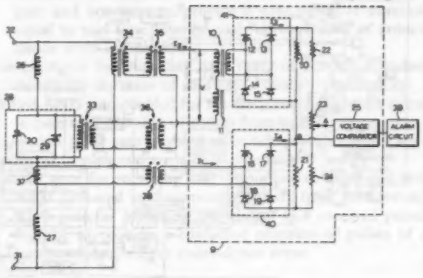
produce an output from said comparator amplifier in one sense when said thermocouple is normal and an output in another sense when said thermocouple is abnormal.

3,973,185

CIRCUIT FOR MONITORING THE INDUCTANCE OF AN INDUCTIVE LOAD TO INDICATE OCCURRENCE OF A FAULT

John H. Beak, and Gordon W. Speer, both of Peterborough, Canada, assignors to General Electric Company, Phila., Pa.

Filed Nov. 13, 1974, Ser. No. 523,281
Claims priority, application Canada, June 24, 1974, 203211
Int. Cl.[2] G01R 31/02
U.S. Cl. 324—51 2 Claims



1. A circuit for sensing change in the inductance of an inductive load energized from controlled switching means which comprises:

a. an inductor;

b. first circuit means connected in circuit with the inductive load for generating a voltage proportional to the voltage applied across the inductive load and for applying said generated voltage across said inductor;

c. a first current transformer responsive to current flowing through said inductor for generating a first signal proportional to the current flowing through said inductor;

d. a second current transformer responsive to the current flowing through said inductive load for generating a second signal proportional to the current flowing through said inductive load;

e. means for rectifying said first signal and applying unidirectional voltage proportional to said first signal across a first resistor;

f. means for rectifying said second signal and applying unidirectional voltage proportional to said second signal across a second resistor, said first and second resistors being connected in series circuit relation;

g. a voltage divider connected across said first and second resistors; and

h. indicating means connected between a selected point on said voltage divider and the junction of said first and second resistors for detecting change in the inductance of said inductive load.

3,973,186

GAS ANALYZING METHOD AND APPARATUS FOR PERFORMNG THE SAME

Hiromichi Uehara; Mitsutoshi Tanimoto, both of Sagamihara, and Yasuharu Ijuin, Kodaira, all of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

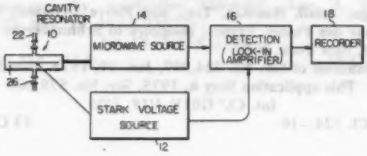
Filed Aug. 28, 1974, Ser. No. 501,231
Claims priority, application Japan, Sept. 5, 1973, 48-99195
Int. Cl.[2] G01R 27/04
U.S. Cl. 324—58.5 A 5 Claims

3. A gas analyser comprising

a microwave rectangular cavity resonator having a Stark electrode disposed therein,

means for applying an alternating current Stark voltage and a direct current Stark voltage to the Stark electrode and for varying the magnitude of the direct current Stark voltage,

means for supplying microwave energy of fixed frequency to the rectangular cavity,



a phase sensitive detector connected to the Stark voltage applying means and to the microwave unit, and

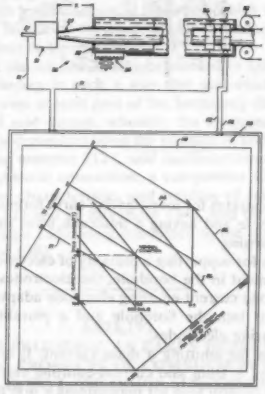
a recorder connected to the phase-sensitive detector.

3,973,187

SENSING CAPACITANCE AND THICKNESS OF INSULATED CABLE TO PROVIDE OUTPUTS RELATED TO WEIGH AND PERCENT VOIDS

Manuel Ramon Cereijo, Atlanta, and Timothy Stephen Dougherty, Norcross, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 321,082, Jan. 4, 1973, Pat. No. 3,914,357.
This application June 2, 1975, Ser. No. 583,003
Int. Cl.[2] G01R 27/26
U.S. Cl. 324—61 R 6 Claims



1. A method of monitoring an elongated dielectric material including at least a cellular dielectric material, which includes the steps of:

advancing an elongated dielectric material which includes at least a layer of a cellular dielectric material;

measuring the capacitance and the associated thickness of the elongated dielectric material;

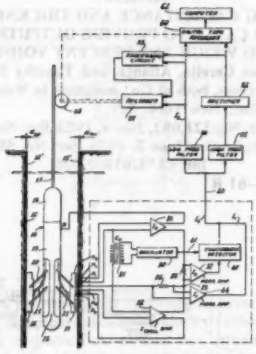
generating electrical signals related to the measured capacitance and associated thickness of the elongated dielectric material and transforming these signals into other signals related to the weight of the dielectric material per unit length and the percent of voids in the cellular dielectric material.

3,973,188

METHOD AND APPARATUS FOR THE DETERMINATION OF THE THICKNESS OF A MUDCAKE LAYER ON A BOREHOLE WALL TRAVERSING A SUBSURFACE EARTH FORMATION

Georges Attali, Houston, Tex., and Pierre Grimaldi, Saint-Maur des Fosses, France, assignors to Schlumberger Limited, New York, N.Y.

Continuation of Ser. No. 324,907, Jan. 19, 1973, abandoned.
This application May 6, 1975, Ser. No. 575,069
Int. Cl.[2] G01V 3/18, 3/06
U.S. Cl. 324—10 13 Claims



1. An apparatus for investigating earth formations traversed by a borehole and having a mudcake layer on the borehole wall, comprising:

a. means for supporting a plurality of electrodes adapted for movement in the borehole, the electrodes comprising at least one current-emitting electrode adapted for emitting current into the borehole and a plurality of potential measuring electrodes;

b. means for emitting a main current, I_0 and an auxiliary current, I_1 from said current-emitting electrode;

c. a first control loop for maintaining a first potential difference between two measure electrodes in one portion of the borehole;

d. a second control loop for maintaining a second potential difference between two measure electrodes at a second portion of the borehole, said first and second control loops arranged to produce auxiliary current flow primarily in the borehole and mudcake formed on the borehole wall and main current flow primarily in the formation surrounding the borehole;

e. means for producing a first signal representative of the magnitude of the main current;

f. means for producing a second signal indicative of the magnitude of the auxiliary current;

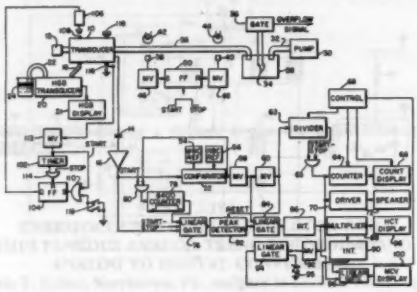
g. means for combining said first and second signals to produce a third signal proportional to $(I_1-\lambda I_0)$ where λ is a constant coefficient, said third signal being representative of the mudcake thickness.

3,973,189

HEMATOLOGY SYSTEM

Henry R. Angel, Trumbull; Arthur R. Oefinger, Stratford, and James W. Hennessy, Trumbull, all of Conn., assignors to General Science Corporation, Bridgeport, Conn.

Continuation of Ser. No. 253,281, May 15, 1972, abandoned.
This application Jan. 27, 1975, Ser. No. 544,643
Int. Cl.[2] G01N 27/00
U.S. Cl. 324—71 CP 2 Claims



1. A blood cell analysis system comprising:

means for providing electrical pulses in response to blood cells suspended in a liquid sample passing through an aperture through which said sample liquid is caused to flow;

means including a selected threshold level and operative in response to said electrical pulses having an amplitude above said threshold level to provide cell output pulses;

means for providing a start signal representative of the commencement of an analytical run;

a counter enabled by said start signal and operative in response to said cell output pulses to provide a predetermined fixed number of counter output pulses;

a first linear gate enabled by said start signal and operative to provide a predetermined number of gate output pulses each of a height proportional to the volume of a corresponding blood cell in response to said electrical pulses and said predetermined fixed number of received counter output pulses;

a peak detector operative in response to said gate output pulses to provide detector output pulses each having a uniform amplitude representative of the peak amplitude of corresponding ones of said gate output pulses and representative of the volume of a corresponding blood cell;

a first multivibrator receiving said cell output pulses and providing uniform width gating pulses;

a second linear gate receiving and detector output pulses and said uniform width gating pulses and providing a predetermined number of output pulses each of the same width and of a uniform amplitude representative of the amplitude of corresponding ones of said detector output pulses;

a first integrator operative in response to the output pulses from said second linear gate to provide a calibrated analog output signal representative of mean corpuscular volume;

divider means operative in response to said cell output pulses to provide a plurality of pulses of a number representative of the number of cells in a predetermined volume of sample liquid;

a second integrator operative in response to said plurality of pulses to provide a second analog signal of a magnitude representative of blood cell count for a predetermined volume of sample liquid;

a function generator operative in response to said second analog signal to provide a corrected analog output signal

of a magnitude representative of blood cell count corrected for coincidence error;

a third linear gate operative in response to said corrected output signal and for the interval of said start signal to charge a capacitor to a voltage representative of blood cell count;

a fourth linear gate operative upon discontinuance of said start signal to provide an output signal derived from the discharge of said capacitor and defining a time interval representative of coincidence error correction;

a comparator coupled to the output of said fourth linear gate and operative to provide a gate signal of duration equal to said time interval and representative of coincidence error correction;

an oscillator for providing a plurality of correction pulses during the duration of said gate signal;

a first AND gate enabled for the duration of said start signal to pass said plurality of pulses from said divider means;

a second AND gate enabled upon termination of said start signal to pass said correction pulses; and

an OR gate for receiving said output pulses from said first AND gate and said correction pulses from said second AND gate for providing the sum of said received pulses thereby to provide a corrected plurality of pulses of a number corrected for coincidence error.

3,973,190

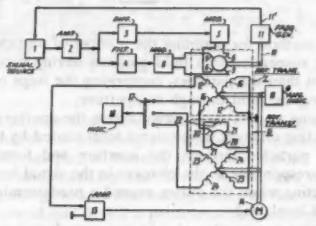
INFRALOW FREQUENCY TRANSFER FUNCTION ANALYZER

Lev Petrovich Ulyanov, Eropkinsky pereulok, 7, kv. 6, Moscow, U.S.S.R.

Filed Aug. 13, 1973, Ser. No. 387,809

Int. Cl.² G01R *23/00*

U.S. Cl. 324—78 R **2 Claims**



1. An infralow frequency controlled-member transfer function analyzer comprising an electromechanical infralow frequency generator which includes an output shaft; a rotary transformer which includes a rotor including two rotor windings and a stator including two stator windings, said rotor being mechanically coupled to said output shaft of said electromechanical infralow frequency generator; a modulator connected and feeding an output to said rotary transformer; a matching amplifier adapted for being coupled to said controlled member to receive a signal therefrom; a differentiator connected to said matching amplifier and through said modulator to said rotor winding of said rotary transformer; a second modulator; a smoothing filter connected to said matching amplifier in parallel with said differentiator and through said second modulator to said rotor winding of said rotary transformer; a servomotor which drives said stator of said rotary transformer, said stator of said rotary transformer including a means indicating the phase angle of the signal at the output of the controlled member under investigation; an A.C. amplifier connected to said servomotor and to one of said stator windings of said rotary transformer; a switch; an indicating instrument which indicates the amplitude of the signal at the output of the controlled member under investigation, said instrument being connected through said switch to the other of said stator windings of said rotary transformer.

3,973,191

INDUCTIVE DISPLACEMENT SENSOR APPARATUS

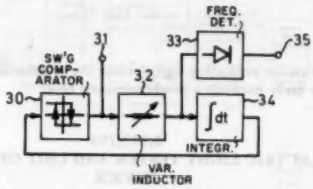
Erich Zabler, Karlsruhe, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Nov. 14, 1974, Ser. No. 523,869

Claims priority, application Germany, Apr. 3, 1974, 2416237; Nov. 20, 1973, 2357791

Int. Cl.² G01R *33/00*

U.S. Cl. 324—34 D **10 Claims**



1. Inductive displacement sensor apparatus comprising:

a variable inductor having a substantially U-shaped core (11) of ferromagnetic material, an electromagnet winding (10) thereon and a short-circuiting ring member (12) arranged to provide a short-circuit path around and adjacent to each leg of the core at a position which is movable along the length of the core legs in accordance with a displacement to be measured, and

an oscillator circuit (30,32,34) connected to said electromagnet winding in such a way that said electromagnet winding forms at least part of the frequency determining portion of said circuit, whereby the frequency of said oscillator is dependent upon the position of said short-circuiting ring member (12), said oscillator circuit including, in sequential connection, a comparator (30) having a hysteresis characteristic, said winding of said variable inductor (32) and an integrator (34), and the output of said integrator (34) being connected to the input of said comparator (30).

3,973,192

DEVICE FOR PROVIDING AN EARLY DETECTION OF AEROSOL PRODUCTS OF COMBUSTION OF A POLYVINYL CHLORIDE SUBSTANCE

Eduard Wilhelm Leonhard Justi, Schapen; Henning Ewe, Braunschweig, and Peter Wilhelm Reinhard Brennecke, Lehre, all of Germany, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Nov. 5, 1974, Ser. No. 520,969

Claims priority, application Switzerland, Nov. 28, 1973, 160939/73

Int. Cl.² G01R *27/02*; H01C *7/00*

U.S. Cl. 324—65 R **5 Claims**

1. Device for providing an early detection of aerosol products of combustion originating at least partly from a polyvinyl chloride substance, comprising an electric resistance body including a layer of magnesium dichloride arranged to be exposed to said aerosol products of combustion, an electric measuring circuit having two input electrodes connected to the resistance body and two output electrodes arranged to generate an output signal dependent on the resistance of said

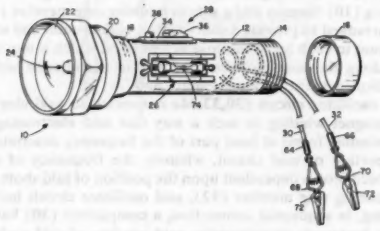
resistance body, and an indicating means connected to said output electrodes of the measuring circuit and arranged to

generate an indicating signal when the resistance of the resistance body exceeds a predetermined level.

3,973,193
ELECTRIC LIGHT TESTER AND UNIT OPERATING DEVICE

John C. Hayes, 8316 Lages Lane, Baltimore, Md. 21207

Continuation of Ser. No. 456,598, April 1, 1974, abandoned, which is a continuation of Ser. No. 332,352, Feb. 14, 1973, abandoned. This application Apr. 14, 1975, Ser. No. 567,919
Int. Cl.² G01R *31/02*
U.S. Cl. 324—51 **3 Claims**



1. An electric light, circuit tester and operating device for electrically operating units, comprising in combination:

a. an elongated hollow casing having means for attaching a two terminal electric light bulb to one end thereof and a removable cap positioned over the opposite end, the inner area of the casing being of such dimension as to receive a pair of coiled current conducting cables of a length substantially greater than the length of the casing;

b. a switch fixedly secured to the casing adjacent the light bulb end of the casing, said switch including a conductive, resiliently deflectable switch strip adapted for sliding along the outer surface of said casing and having a first contact and a second contact spaced therefrom, said first and second contacts depending from respective ends of the switch strip, said switch further including a conductive contact block fixed to said casing and having first and second contacts spaced for selective connection to the first and second contacts of the switch strip, the first contact of said switch strip being deflectable for momentary contact with the first contact of said contact block and the second contact of said switch strip being slideable for prolonged positioning into and out of engagement with the second contact of said contact block;

c. the conductive contact block further including an extended portion connected to one terminal of the light bulb and to one end of one of the cables;

d. means at one end of the second mentioned cable for connecting the same to the other terminal of the electric light bulb;

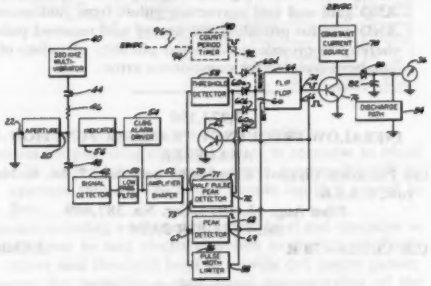
e. means including a fuse for electrically connecting the end of the cable connected to the second mentioned light bulb terminal to the switch strip, the unconnected ends of said cables being adapted for connection to said electrically operating units,

whereby, any electric current will be shunted around the light bulb when the switch is closed for extinguishing the said light bulb and to operate the said unit.

3,973,194
PARTICLE COUNTER

Daniel W. McMorris, Redondo Beach, and William J. Skidmore, III, Costa Mesa, both of Calif., assignors to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Aug. 7, 1972, Ser. No. 278,422
Int. Cl.² G01N *27/00*
U.S. Cl. 324—71 CP **23 Claims**



1. A method for counting the number of particles per unit volume suspended in a fluid medium having a conductivity different than the particles, comprising the steps of:

passing the fluid through an aperture;

applying an electronic signal across the aperture;

detecting changes in the signal level caused by the passage of particles through the aperture and forming pulses corresponding to the changes in the signal level;

detecting when the pulses exceed a predetermined threshold level; and

charging a capacitor at a known rate during a portion of each pulse that exceeds the predetermined threshold level, to develop a voltage on the capacitor corresponding to the number of particles per unit volume of the fluid medium, said voltage being independent of flow rate and the volume of fluid passed through the aperture.

3,973,195
CURRENT POTENTIAL INDICATOR

Robert A. Williams, and David M. Holt, both of Forth Worth, Tex., assignors to Williams Instrument, Inc., Fort Worth, Tex.

Division of Ser. No. 85,693, Oct. 30, 1970, Pat. No. 3,820,023. This application May 13, 1974, Ser. No. 469,055
Int. Cl.² G01R *31/02, 19/14*
U.S. Cl. 324—72.5 **8 Claims**

1. A current potential indicator especially suitable for weapons test systems, said indicator comprising:

a test probe housing;

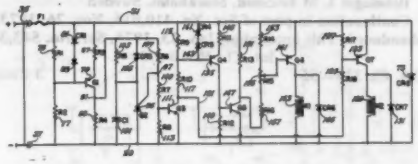
a pair of electrical contacts carried by one end region of the housing;

an electrical minimum event indicator carried by said housing;

an electrical threshold indicator carried by said housing;

circuit means connected between said contacts and said minimum event indicator for actuation thereof upon sensing a selected minimum quantity of electrical energy;

said circuit means also connected between said contacts and said threshold indicator for actuation thereof when sensing a selected quantity of electrical energy above said minimum; and



load disconnect means included in said circuit means and responsive to electrical energy applied to said contacts as a function of time for disconnecting the circuit means after a selected time interval of electrical energy application.

3,973,196

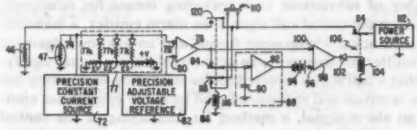
METHOD AND APPARATUS FOR EJECTING A METERED AMOUNT OF PARTICULATE SAMPLE

Walter R. Hogg, Miami Lakes, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 473,127, May 24, 1974, Pat. No. 3,890,569. This application June 5, 1975, Ser. No. 584,142

Int. Cl.² G01N *27/00*

U.S. Cl. 324—71 CP **22 Claims**



1. In a particle study device having an ejecting means including means for receiving and temporarily storing a given amount of sample, a thermal expansion device mounted within the said receiving and storing means, and means for supplying energy to said thermal expansion device to raise the temperature of said device a predetermined amount to cause said device to expand and increase in volume thereby to eject a specific minute amount of sample from said receiving and storing means, the improvement comprising;

first means mounted in said thermal expansion device for monitoring said temperature rise, said means having a characteristic which varies with said temperature, and

second means coupled to said first means and said means for supplying energy and operative in response to said first means having a predetermined characteristic to terminate supply of said energy to said thermal expansion device.

3,973,197

PEAK DETECTOR

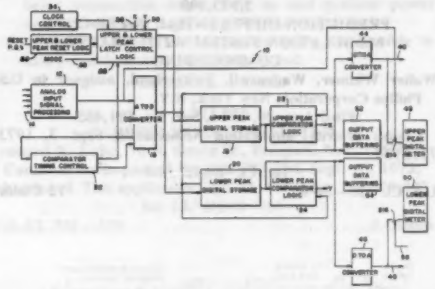
Walter E. Meyer, Royal Oak, Mich., assignor to Koehring Company, Milwaukee, Wis.

Filed July 22, 1974, Ser. No. 490,913

Int. Cl.² G01R *19/04*

U.S. Cl. 324—103 P **9 Claims**

1. Structure for substantially instantaneously detecting a peak in an analog electrical signal comprising analog to digital converter means for substantially instantaneously developing current digital signals representative of the current value of the analog electrical signal, storage means for storing a digital signal representative of a previous peak in the analog signal connected to the analog to digital converter means, comparator means for substantially instantaneously comparing each current digital signal with the stored digital signal connected to the converter and comparator, peak latch control logic means for substantially instantaneously replacing the stored digital signal in the storage means with each developed current digital signal having a predetermined relation to a stored digital signal to provide a new stored digital signal connected to the comparator means and storage means and timing means connected to the comparator and to the peak latch control logic means for cyclically providing a first pulse of duration



sufficient to permit the comparator to compare the stored and current digital signals, a second delay pulse immediately following the first pulse to permit the structure to become electrically stable, the trailing edge of which permits operation of the peak latch control means, a third pulse immediately following the second pulse for providing a safety wait time delay to allow the structure to again become electrically stable after operation of the peak latch control logic means, and a fourth pulse immediately following the third pulse on the leading edge of which the converter is actuated and the timing cycle is re-started.

3,973,198

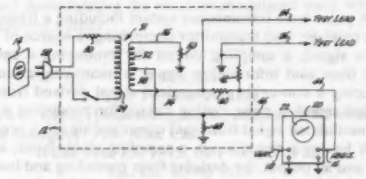
IN-CIRCUIT SEMICONDUCTOR TESTER

Bill Hunt, 4317 Rucker, Everett, Wash. 98203

Filed Oct. 29, 1974, Ser. No. 518,244

Int. Cl.² G01R *31/22*

U.S. Cl. 324—158 D **14 Claims**



10. An in-circuit semiconductor junction tester, useful in combination with a two coordinate indicator means having two input connections referenced to ground, for indicating the operating state of a semiconductor junction while the semiconductor remains connected in circuit, the semiconductor junction tester comprising:

a. transformer means having a primary winding and at least one secondary winding, said secondary winding having in succession therealong a common lead, a second voltage tap point, and a first voltage tap point;

b. first impedance means connected between said first voltage tap point and ground;

c. second impedance means connected between said second tap point and ground;

d. means connecting said second voltage tap point to one input of the two coordinate indicator means;

e. test lead means adapted to connect the semiconductor junction between said common lead and ground; and

f. third impedance means connected between said common lead and ground for applying at least a portion of the signal developed in operation across said semiconductor junction to the other input of said two coordinate indicator means.

3,973,199
PREDICTION DIFFERENTIAL PULSE CODE MODULATION SYSTEM WITH ADAPTIVE COMPOUNDING

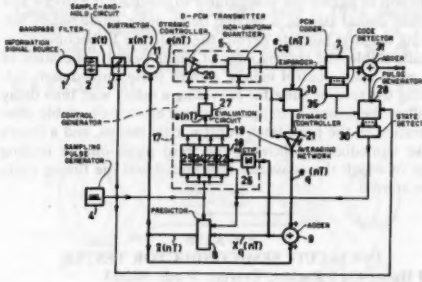
Walter Widmer, Wadenswil, Switzerland, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 29, 1974, Ser. No. 501,485

Claims priority, application Netherlands, Sept. 3, 1973, 7312104

Int. Cl.² H04B 1/00

U.S. Cl. 325—38 B **12 Claims**



1. A pulse code transmission system including a transmitter and a receiver, said transmitter comprising: a source of information signal; a sampling circuit for producing a sampled signal from said information signal; a quantizing circuit for producing a non-uniform quantized signal derived from said sampled signal; a pulse coding circuit for producing a pulse code modulated signal from said quantized signal; a predictor circuit having a signal input, a sampling clock input, a reset input and an output, for deriving from preceding and instantaneous signal samples a prediction signal; an adder for combining the prediction signal with the quantized signal and for applying the combined signal to the signal input of said predictor circuit; a subtractor coupled between said sampling circuit and the output of said predictor circuit for producing a difference signal from the sampled signal and the prediction signal, said difference signal being applied to said quantizing circuit; a control generator fed by said combined signal and including a combination of a storage network with an averaging network for producing a control signal corresponding to the average of the absolute values of said combined signal over a limited number of sampling periods; first dynamic control means coupled between said subtractor and said quantizing circuit for controlling the dynamic range of said quantizing circuit for said difference signal; and second dynamic control means coupled between said quantizing circuit and said adder for controlling the dynamic range of said quantized signal, each dynamic control means having a control input fed by said control signal from said control generator.

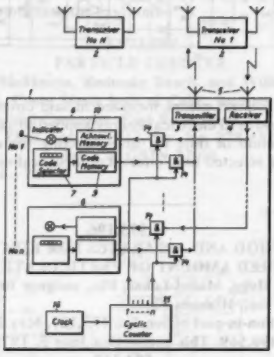
3,973,200
PROCESS FOR ACKNOWLEDGING CALLS IN A SYSTEM FOR WIRELESS STAFF LOCATORS

Dag Erson Åkerberg, Jarfalla, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Continuation-in-part of Ser. No. 410,015, Nov. 26, 1973, abandoned. This application Jan. 23, 1975, Ser. No. 543,365

Int. Cl.² H04B 5/04

U.S. Cl. 325—55 **3 Claims**



1. In a system having a central station including means for repeatedly and cyclically transmitting coded call signals and a number of substations each including means for selectively receiving the coded call signals, an alarm emitter, a manually actuated acknowledgement means and an acknowledgement transmitter for delivering an acknowledgement signal signifying that a call signal directed to the substation in question has been received and recognized, and its alarm emitter has emitted an alarm signal, a method for identifying at the central station which substation has transmitted the acknowledgement signal received at the central station comprising the steps of at a substation, on condition that its acknowledgement means has been manually actuated after the alarm signal has been recognized, transmitting a short acknowledgement signal which is the same for all substations immediately after the call signal occurring after manual actuation of the acknowledgement means has been received and recognized as being directed to the substation, keeping the central station ready for a short time interval after the transmission of a call signal to receive an acknowledgement signal, and allotting the received acknowledgement signal to the substation whose coded call signal was last transmitted.

3,973,201
PSK MODULATOR WITH REDUCED SPECTRUM OCCUPANCY

Carl F. Andren, St. Petersburg, Fla., assignor to NCR Corporation, Dayton, Ohio

Filed Aug. 16, 1974, Ser. No. 497,979

Int. Cl.² H04B 1/04

U.S. Cl. 325—163 **10 Claims**

1. Apparatus for modulating a carrier signal with a digital data signal comprising in combination:

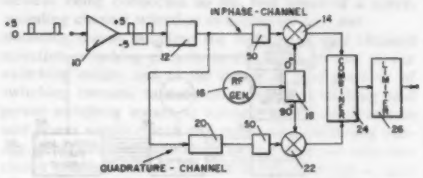
filter means for receiving and filtering a digital data signal;

carrier generator means for providing a first and a second carrier signal in phase quadrature with each other;

a first modulator connected to said filter means and to said carrier generator means for modulating said first carrier signal as a function of the filtered digital data signal from said filter means;

a second modulator connected to said carrier generator means for modulating said second carrier signal as a function of a control signal;

circuit means connected to said filter means for providing said control signal, which control signal adjusts the amplitude of the second carrier signal to complement the amplitude of the modulated first carrier signal;



a signal combiner connected to said first and to said second modulators for combining the modulated carrier signals from said first and said second modulators; and

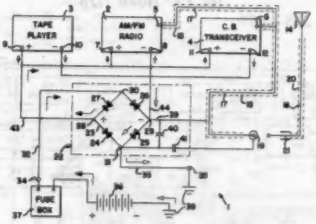
amplitude limiting means connected to said signal combiner for limiting the amplitude variations in the combined modulated carrier signal.

3,973,202

PORTABLE ELECTRONIC SYSTEM FOR USE WITH A DIRECT CURRENT SOURCE HAVING A GROUND OF EITHER POSITIVE OR NEGATIVE POLARITY

John Gardner, Kansas City, Kans., assignor to Trans-Comm Mfg. Inc., Leawood, Kans.

Filed May 16, 1975, Ser. No. 578,135
Int. Cl.² H04B 1/06
U.S. Cl. 325—313 10 Claims



8. A power polarity inverter and antenna lead shield direct current isolation circuit for use with a portable system of electronic sound and/or communication equipment wired for use in vehicles having a negative ground direct current electrical system, said portable system having a positive power terminal, a negative ground terminal, and an antenna terminal, said portable system having for use therewith an antenna mountable on the vehicle in which the equipment is to be used, said vehicle having a voltage source with one and another source terminals of opposite polarities, said vehicle having a ground of either positive or negative polarity, said antenna having a shielded lead terminating in a plug having a plug lead connector and a plug shield connector, said circuit comprising:

a. a power polarity inverter means having first, second, third, and fourth diodes connected in a loop, each of said diodes having an anode and a cathode, said first and fourth diodes having the cathodes thereof connected together forming a positive inverter output terminal, said second and third diodes having the anodes thereof connected together forming a negative inverter output terminal, said first diode anode being connected to said second diode cathode forming one non-polarized inverter input terminal, and said third diode cathode being connected to said fourth diode anode forming another non-polarized inverter input terminal;

b. an antenna jack having a jack lead connector and a jack shield connector, said antenna jack adapted to receive therein said antenna plug;

c. a first capacitor of a value selected to pass interference frequency signals having opposite terminals and connected between said antenna jack shield connector and one of said non-polarized inverter input terminals;

d. said non-polarized inverter input terminals being connectible to said vehicle voltage source terminals;

e. said positive and said negative inverter output terminals being connectible respectively to said positive power terminal and said negative ground terminal; and

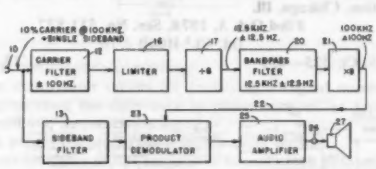
f. said antenna jack lead connector being connectible to said portable system antenna terminal.

3,973,203

CARRIER ISOLATION SYSTEM

Leonard R. Kahn, 70 N. Grove St., Freeport, N.Y. 11520

Continuation-in-part of Ser. No. 288,704, Sept. 13, 1972, abandoned. This application Sept. 30, 1974, Ser. No. 510,445
Int. Cl.² H04B 1/68
U.S. Cl. 325—330 9 Claims



1. A method of operating on a received amplitude modulated carrier wave so as to reduce unwanted noise and undesired frequency waves, comprising the following steps:

a. filtering the carrier wave from the amplitude modulated wave;

b. dividing the carrier wave frequency by a factor greater than unity;

c. filtering the divided carrier wave to reduce the noise and unwanted frequencies adjacent to the carrier wave; and

d. multiplying the resulting carrier wave frequency by the same factor used in division to restore the original carrier wave frequency;

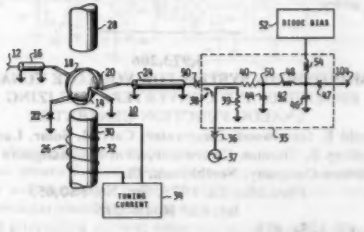
e. and demodulating the received modulated wave with the restored carrier.

3,973,204

YIG TUNED MIXER

Richard C. Kelter, Healdsburg, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 25, 1975, Ser. No. 552,912
Int. Cl.² H04B 1/26
U.S. Cl. 325—448 5 Claims



1. A mixer comprising:

a housing;

a yttrium-iron-garnet tuning element mounted in the housing;

input means in the housing for coupling an input signal to the tuning element;

coupling means in the housing for coupling signals from the tuning element;

a transmission line, having a characteristic impedance connected to the coupling means;

a nonlinear mixing element mounted in the housing in the immediate proximity of the tuning element and connected in series with the coupling means; and

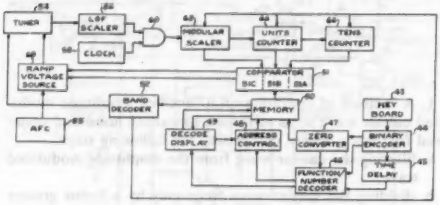
a coupling network connected to the coupling means by the transmission line for supplying a drive signal to and receiving an intermediate frequency signal from the mixing element, the coupling network including a series connected resistor having a resistance substantially equal to the characteristic impedance of the transmission line for absorbing undesired reflected signals.

3,973,205

TELEVISION TUNING SYSTEM INDICATOR

Akio Tanaka, Evanston, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Oct. 3, 1974, Ser. No. 511,837
Int. Cl.² H04B 1/16
U.S. Cl. 325—455 **13 Claims**



1. A television tuning system for selectively tuning a plurality of fixed frequency bandwidth television channels identified by single and two digit channel numbers, comprising:

tuning means responsive to two digit channel number inputs for tuning to said plurality of fixed frequency bandwidth television channels;

memory means coupled to said tuning means for storing a desired sequentially entered two digit channel number including single digit channel numbers having zero for a tens digit;

display means for displaying the digits of a stored channel number in tens and units display areas; and

decode means coupled to said display means enabling the display of the first entered digit of said desired channel number in the tens display area and blanking the units display area and for enabling display of digits in both display areas only after completion of a second digit entry.

3,973,206

MONITORING SYSTEM FOR VOLTAGE TUNABLE RECEIVERS AND CONVERTERS UTILIZING AN ANALOG FUNCTION GENERATOR

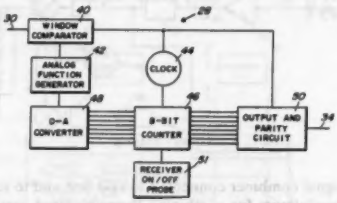
Donald E. Haselwood, Clearwater; Carl M. Solar, Largo, and Jeffrey R. Thumm, Clearwater, all of Fla., assignors to A. C. Nielsen Company, Northbrook, Ill.

Filed May 22, 1975, Ser. No. 580,055
Int. Cl.² H04B 1/16
U.S. Cl. 325—455 **13 Claims**

10. A method for determining the channel of a plurality of channels to which a voltage tunable receiver is tuned comprising the steps of

generating a first variable signal having a characteristic linearly related to the sequence of channels to which the receiver may be tuned,

modifying said first signal to provide a second variable signal having a predetermined characteristic that is nonlinearly related to said sequence of channels,



comparing said predetermined characteristic of said second signal with said tuning voltage and

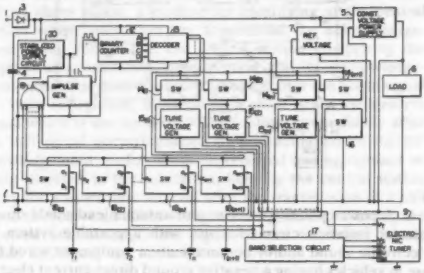
determining the channel corresponding to said second signal when the predetermined characteristic of said second signal has a predetermined relationship to said tuning voltage.

3,973,207

ELECTRONIC CHANNEL SELECTOR INCLUDING CONTROL MEANS FOR SELECTING A CHANNEL AND APPLYING POWER TO A LOAD CIRCUIT

Toshio Sugizaki, Fujisawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 11, 1975, Ser. No. 557,417
Int. Cl.² H04B 1/26
U.S. Cl. 325—457 **8 Claims**



4. An electronic channel selector for selecting a desired channel and applying power to a load circuit comprising:

a. a pair of input terminals for coupling to an external power source;

b. a power supply circuit connected across said input terminals for supplying power to said load circuit;

c. power switching means connected across said input terminals, said power switching means having an input, a first output and a second output coupled to said power supply circuit for controlling the supply of power to said load;

d. a plurality of tuning voltage generators;

e. an electronic tuner coupled to the outputs of said tuning voltage generators, said tuner selecting a channel corresponding to the output of a selected one of said tuning voltage generators;

f. a plurality of switching circuits, each of said switching circuits being connected in series with a corresponding tuning voltage generator across said input terminals, and having an input and an output;

g. a plurality of channel selection switching circuits each having a first input, a second input and an output, the second inputs of said channel selection switching circuits being connected to the outputs of corresponding switching circuits;

h. a plurality of switching devices, each of said switching devices being connected to the first input of a corresponding channel selection switching circuit, and

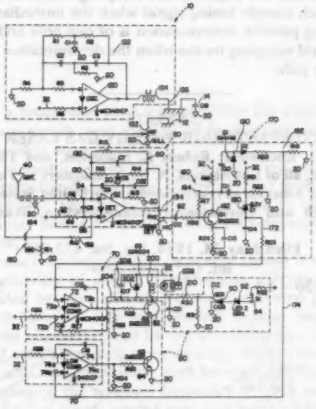
i. decoding means coupling the outputs of said channel selection switching circuits to the input of said power switching means and to the inputs of said plurality of switching circuits, said decoding means switching said power switching means to connect said load circuit to said power supply circuit and connecting the tuning voltage generator corresponding to the channel selection circuit coupled to the energized switching device to said electronic tuner thereby selecting the desired channel.

3,973,208

CAPACITOR DETECTOR DEVICE

Donald A. Diamond, Norcross, Ga., assignor to Dovey Manufacturing Company, Anderson, Ind.

Filed Feb. 14, 1975, Ser. No. 550,111
Int. Cl.² G08B *13/26*
U.S. Cl. 328—5 **11 Claims**



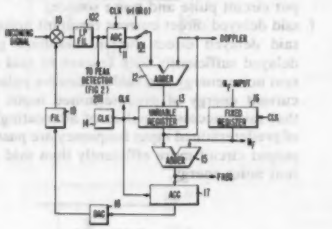
1. A capacitor detector device for detecting the change of capacitance in a protected zone, said device comprising: an antenna element adapted to be mounted in spaced relationship with a grounded element to define said protected zone between said elements and having a nominal capacitance therebetween which capacitance is changed upon intrusion of an object to be detected; an oscillator means independent of said antenna element for pumping at a preselected frequency said grounded element with respect to an internal floating ground of said device; means for connecting said antenna to said floating ground of said device whereby said antenna is capacitively coupled to said pumped grounded elements; and means for detecting changes in the capacitive coupling of selected amounts between said antenna element and said pumped grounded element.

3,973,209

DIGITAL ARITHMETIC SYNTHESIZER PHASE LOCK LOOP WITH DIRECT DOPPLER AND FREQUENCY READOUT

Edward Joachim Nossen, Cherry Hill, N.J., and Eugene Richard Starner, Bethlehem, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 29, 1975, Ser. No. 609,004
Int. Cl.² H03B *19/00*
U.S. Cl. 328—14 **6 Claims**



1. The combination comprising:

phase comparator means for producing a digital number representing the difference in phase between an input signal and a synthesized signal;

clock means for producing periodic clock pulses;

first accumulator means responsive to said clock pulses for accumulating the digital number from said phase comparator means to produce a variable digital number;

storage means for storing a fixed digital number;

adder means responsive to said variable and said fixed digital numbers for producing a digital frequency number;

second accumulator means responsive to said clock pulses for accumulating successive digital frequency numbers to produce a digital phase number; and

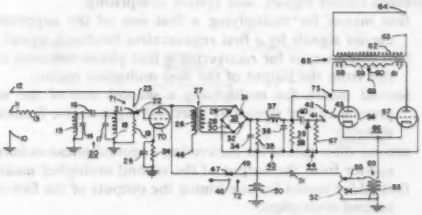
converter means responsive to said digital phase number for producing the synthesized signal.

3,973,210

ELECTRICAL WAVE FILTER

Thomas W. Holden, 301 W. 16 Pl., Chicago Heights, Ill. 60411

Filed Jan. 14, 1975, Ser. No. 540,858
Int. Cl.² H04B *15/00*; H03K *5/04*; H03H *7/02*
U.S. Cl. 328—167 **3 Claims**



1. An electric wave filter comprising:

a. input means for receiving alternating current noise energy and successive pulses of alternating current energy of predetermined input frequency;

b. said alternating current noise energy and said pulses of alternating current energy of predetermined input frequency connected to a means for producing direct current components from said alternating current noise

energy and said successive pulses of alternating current energy of predetermined input frequency;

c. a filter connected in the circuit with said means for producing direct current components for producing delayed direct current resultant noise envelopes and delayed direct current resultant pulse envelopes;

d. said delayed direct current resultant noise envelopes and said delayed direct current resultant pulse envelopes connected to increase the gain of an output circuit;

e. said alternating current noise energy and said successive pulses of alternating current energy of predetermined input frequency connected to said output circuit as output circuit pulse and noise source;

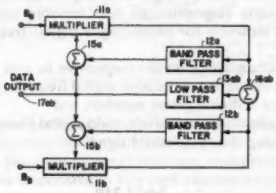
f. said delayed direct current resultant noise envelopes and said delayed direct current resultant pulse envelopes delayed sufficiently with respect to said alternating current noise energy and said successive pulses of alternating current energy of predetermined input frequency such that said successive pulses of alternating current energy of predetermined input frequency are passed through said output circuit more efficiently than said alternating current noise energy.

3,973,211

COMBINER-DEMODULATOR FOR PHASE SHIFT KEYED SUPPRESSED CARRIER SIGNALS RECEIVED OVER TWO TRANSMISSION PATHS

Gunars Bilsens, and Raymond Oscar Figueroa, both of Scottsdale, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed June 23, 1975, Ser. No. 589,631
Int. Cl.² H03D *3/00*
U.S. Cl. 329—105 **2 Claims**



1. In a diversity receiver for receiving a plurality of suppressed carrier signals, phase modulated with a data signal, including a system for combining and demodulating said suppressed carrier signals, said system comprising:

first means for multiplying a first one of the suppressed carrier signals by a first regenerative feedback signal;

first filter means for recovering a first phase-coherent carrier from the output of the first multiplier means;

second means for multiplying a second one of the suppressed carrier signals by a second regenerative feedback signal;

second filter means for recovering a second phase-coherent carrier from the output of the second multiplier means;

first adder means for combining the outputs of the first and second multipliers;

third filter means for recovering the data signal from the output of the first adder means;

second adder means for combining said first phase-coherent carrier and said data signal to produce the first regenerative feedback signal;

third adder means for combining said second phase-coherent carrier and said data signal to produce the second regenerative feedback signal; and

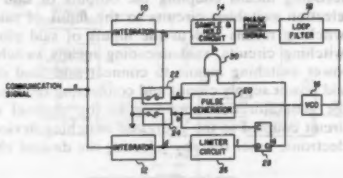
an output terminal for the data signal connected to the output of the third filter means.

3,973,212

PHASE DETECTION IN PHASE LOCK LOOP CIRCUIT

Wesley F. Walloch, Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 28, 1975, Ser. No. 608,430
Int. Cl.² H03D *3/00*
U.S. Cl. 329—122 **13 Claims**



1. A phase detector for use in a phase lock loop circuit to which is applied an A. C. carrier communication signal, comprising:

sampling means for sampling the communication signal and holding the sampled value until the next sample when enabled;

means for generating a sample timing signal at a periodic frequency twice that of the carrier;

polarity check means for determining the polarity of the communication signal prior to each sample timing signal at a predetermined interval which is less than one carrier alternation, and

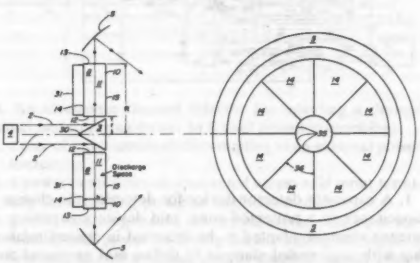
gating means for enabling said sampling means in response to each sample timing signal when the immediately preceding polarity determination is of one pole and inhibiting said sampling means when the determination is of the other pole.

3,973,213

COMPACT, HIGH ENERGY GAS LASER

Stephen D. Rockwood; Robert E. Stapleton, and Thomas F. Stratton, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 28, 1974, Ser. No. 473,660
Int. Cl.² H01S *3/00*
U.S. Cl. 330—4.3 **5 Claims**



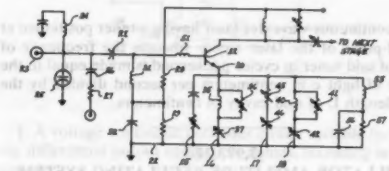
1. A high-energy gas laser amplifier system which comprises (1) means defining an annulus, (2) a plurality of radially directed baffles forming a plurality of truncated wedge-shaped working regions in said annulus-defining means, (3) a gaseous lasing medium contained in each working region, (4) means for containing said lasing medium in said working regions at a desired pressure, (5) means for producing an electrical discharge substantially uniformly throughout each of said working regions, said electrical discharge being sufficient to produce a population inversion in said lasing medium, and (6)

means for expanding a laser beam to be amplified radially outwardly through said working regions.

3,973,214
CIRCUIT TO ACHIEVE LOW NOISE FIGURE

William A. Rheinfelder, Phoenix, Ariz., assignor to Alpha Engineering Corporation, Phoenix, Ariz.

Filed Jan. 20, 1975, Ser. No. 542,191
Int. Cl.² H03F 3/04
U.S. Cl. 330—31 12 Claims



1. In a broadband solid-state amplifier for amplifying high frequency signals over a range of frequencies, an improved first amplifier stage comprising:

a. a transistor having a base for receiving said high frequency signals, said base having an input impedance, said transistor also having a collector and an emitter, said emitter having an intrinsic frequency-dependent impedance;

b. means coupling said high frequency signals to said base;

c. a plurality of passive compensating circuits each connected between said emitter and a common ground and each forming, with said intrinsic emitter impedance, a series resonant circuit having an inductance, capacitance and resistance; said compensating circuits connected in parallel with each other, each having a different resonant frequency, the resonant frequency of each resonant circuit being evenly spaced over said range of frequencies;

d. whereby said input impedance is substantially flat over a predetermined portion of said frequency range and whereby a minimum noise figure is established for said first amplifier stage.

3,973,215
CURRENT MIRROR AMPLIFIER

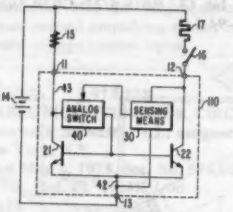
Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

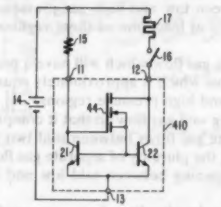
Filed Aug. 4, 1975, Ser. No. 601,831
Int. Cl.² H03F 1/14, 3/04; 323/1,2,4
U.S. Cl. 330—51 20 Claims

1. In combination:

a current mirror amplifier having an input current path between an input terminal and a common terminal, and an output current path between an output terminal and said common terminal; and

means responsive to the cessation of current flow in said



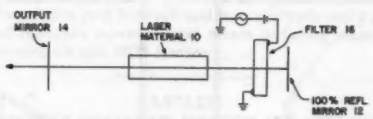


output current path for discontinuing the flow of current through said input current path.

3,973,216
LASER WITH A HIGH FREQUENCY RATE OF MODULATION

Richard Swart Hughes, China Lake; Nicholas Bottka, Ridgecrest, and Peter R. Hammond, China Lake, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 28, 1975, Ser. No. 572,589
Int. Cl.² H01S 3/10
U.S. Cl. 331—94.5 M 9 Claims



1. In a laser having a resonant cavity providing a laser beam, apparatus for modulating the beam at a high frequency rate, comprising:

double heterojunction semiconductor structure within said cavity in the path of said beam, capable of supporting the Franz-Keldysh effect of absorption edge shift;

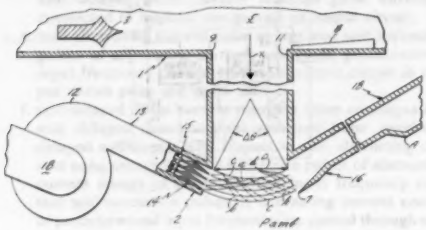
means for causing said effect to occur in said structure in a predetermined pattern such that said beam is modulated in response to said pattern as it passes said structure.

3,973,217

AERODYNAMIC WINDOW ALTITUDE CONTROL

Roy N. Guile, Wethersfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 28, 1975, Ser. No. 608,822
Int. Cl.² H01S 3/22; G02B 5/00
U.S. Cl. 331—94.5 C 3 Claims



1. A method of operating an aerodynamic window in an opening between low and high gas pressure regions wherein the pressure of at least one of these regions is variable comprising

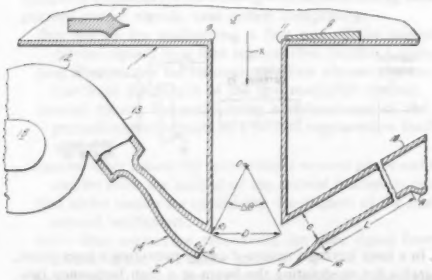
1. forming a gas flow which will have a pressure differential thereacross which is approximately equal to that between the low and high pressure regions,
   a. forming said gas flow so that it comprises a plurality of separate gas flows between said two regions,
2. directing the plurality of separate gas flows from one side of said opening between said low and high gas pressure regions,
3. collecting the plurality of separate gas flows on the other side of said opening,
4. varying the pressure of one of said gas pressure regions,
5. controlling each of the flows of said plurality of separate gas flows to compensate for the effects of variations of the pressure in said varied pressure region so that the separate gas flows have as much of their flow as possible collected on the other side of said opening.

3,973,218

SINGLE NOZZLE FREE-VORTEX AERODYNAMIC WINDOW

C. Edward Kepler, East Hartford, and Roy N. Guile, Wethersfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 21, 1975, Ser. No. 561,021
Int. Cl.² H01S 3/22; G02B 5/00
U.S. Cl. 331—94.5 C 3 Claims



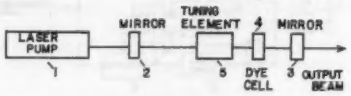
1. In combination in a gas laser device, a lasing region of low pressure, an outlet for an output laser beam in said laser device forming an exit to a second region of a different pressure, an outlet passageway connected to said laser device and extending away therefrom around said outlet, means comprising a single free-vortex nozzle for providing an arcuate gas flow across said passageway which represents the flow of a segment of a free-vortex flow field having a pressure differential which is equal to that between the lasing region and the second region.

3,973,219

VERY RAPIDLY TUNED CW DYE LASER

Chung L. Tang, and John Martin Telle, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Apr. 24, 1975, Ser. No. 571,341
Int. Cl.² H01S 3/10
U.S. Cl. 331—94.5 C 4 Claims



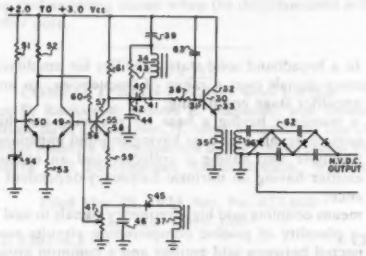
1. A continuous-wave dye laser having a tuner positioned at the mid-point of the laser cavity wherein the frequency of tuning of said tuner in cycles per second is made equal to the velocity of light c in centimeters per second divided by the optical length L of said cavity in centimeters.

3,973,220

OSCILLATOR AMPLITUDE REGULATING SYSTEM

Ferdinand G. Fender, Glenview, and Tore S. Karlsson, Chicago, both of Ill., assignors to Ni-Tec, Inc., Skokie, Ill.

Filed June 2, 1975, Ser. No. 582,913
Int. Cl.² H03B 3/02, 5/12
U.S. Cl. 331—109 5 Claims



1. A regulating system for converting a DC voltage to an alternating voltage of constant peak amplitude comprising:

an oscillator including a transistor having a base and coupled to the DC voltage for converting the DC voltage to an alternating output voltage;

control voltage means responsive to the peak amplitude of the alternating output voltage for providing a control voltage having a magnitude which is inversely related to the peak amplitude of the alternating output voltage, said control voltage means comprising a transformer winding inductively coupled to said ocillator for sensing the alternating voltage output and for providing an alternating first intermediate control voltage which is directly proportional in magnitude to the output alternating voltage from which said control voltage is derived; and

clipping means coupled between said base and said control voltage means for controlling the bias of said transistor to thereby cause said oscillator alternating output voltage to vary in direct relation to said control voltage; whereby,

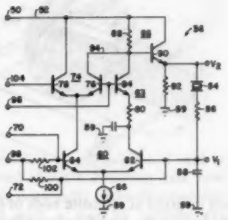
when the peak amplitude of the output voltage increases, said control voltage decreases causing said clipping means to bias said transistor for decreased output voltage and when the peak amplitude of the output voltage decreases, said control voltage increases causing said clipping means to bias said transistor for increased output

voltage to thereby render the peak amplitude of said oscillator alternating output voltage constant.

3,973,221
VOLTAGE CONTROLLED CRYSTAL OSCILLATOR APPARATUS

William B. Jett, Jr., Mesa, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Apr. 7, 1975, Ser. No. 565,331
Int. Cl.² H03B 3/04, 5/36
U.S. Cl. 331—116 R 11 Claims



1. A voltage controlled oscillator circuit suitable for providing differential output oscillation signals, including in combination:

frequency determining means resonant at a predetermined frequency for generation of an output signal having a reference phase and frequency at an output terminal thereof;

first phase shifting means responsive to said output signal from said frequency determining means for providing a voltage output signal, the phase of said voltage output signal lagging said output signal from said frequency determining means by substantially 90°;

first amplifying means receiving said voltage output signal from said first phase shifting means for providing first and second current signals at first and second output terminals respectively, and the differential output oscillation signals, said first and second current signals being substantially 180° out of phase with respect to each other, the phase of said first output current signal being substantially the same as said voltage output signal from said first phase shifting means;

second amplifying means receiving said second current signal from said first amplifying means for developing a current signal at an output terminal thereof, said current signal having substantially the same phase as said second current signal from said first amplifying means, said second amplifying means including first and second input terminals and a common terminal, said common terminal being adapted to receive said second current signal from said first amplifying means, said second input terminal being adapted to receive a bias potential, and said first input terminal being adapted to receive a control voltage signal, the magnitude of said current signal of said second amplifying means being varied in response to said control voltage signal;

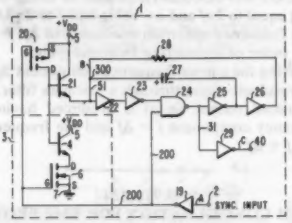
second phase shifting means responsive to said first current signal from said first amplifying means for producing at an output thereof a current signal having a predetermined phase relation to said output voltage signal from said first phase shifting means, said second phase shifting means including a transistor having first, second and control electrodes, said control electrode being coupled to said bias potential, said second electrode being coupled to said output of said second phase shifting means, resistive means, and a capacitor, said resistive means being connected between said first output terminal of said first amplifying means and said first electrode of said transistor, said capacitor being coupled in shunt between said output terminal of said first amplifying means and a ground reference terminal; and

summing means for developing an output signal to said frequency determining means in response to said current signals from said second phase shifting means and said second amplifying means, said output signal from said summing means having a phase which is varied over a predetermined range in accordance with the magnitude of said current signal from said second amplifying means being varied in response to said voltage control signal.

3,973,222
ASTABLE MULTIVIBRATOR CIRCUIT

Nicholas Kucharewski, Somerset, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 2, 1975, Ser. No. 574,022
Int. Cl.² H03K 1/06
U.S. Cl. 331—111 7 Claims



1. A gated astable multivibrator comprising, in combination:

an oscillator responsive to an input signal when of one value for oscillating and to said input signal when of a second value for turning off;

a synchronization circuit for said oscillator comprising a transistor having base, emitter and collector electrodes connected at its collector electrode to an operating voltage terminal, and at its emitter electrode to a terminal of said oscillator circuit, for connecting that terminal to the operating voltage terminal when said transistor conducts, for reducing the time required for the oscillator to synchronize to said input signal;

means responsive to said input signal when of said second value for connecting said base electrode to said operating voltage terminal for turning said transistor on;

a low impedance path comprising the series connection of a semiconductor junction and the conduction path of a MOS transistor; and

means responsive to said input signal when of said one value for disconnecting said base electrode from said operating voltage terminal and for effectively connecting said low impedance path between said base electrode and a point of reference potential, said means including means for turning on said MOS transistor.

3,973,223
FREQUENCY-DEVIATION METHOD AND APPARATUS

Yasuji Uchiyama, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Continuation of Ser. No. 81,011, Oct. 15, 1970, abandoned.
This application May 5, 1975, Ser. No. 574,681
Claims priority, application Japan, Oct. 15, 1969, 44-82412; Oct. 15, 1969, 44-82415; Oct. 16, 1969, 44-98574[U]; Oct. 16, 1969, 44-98575[U]; Oct. 17, 1969, 44-98804[U]; Oct. 15, 1969, 44-82413; Oct. 15, 1969, 44-82414
Int. Cl.² G10H 1/04; H03C 1/52
U.S. Cl. 332—44 2 Claims

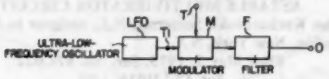
1. In a technique for producing tremolo effects with an electronic musical instrument, an improved frequency-deviation method for producing musical tones that are shifted in

frequency by an amount Δf both above and below a nominal tone frequency f, said method comprising the steps of:

a. generating a modulating signal of said frequency f;

b. generating a carrier signal of a frequency Δf, said frequency f; and

c. amplitude modulating said lower frequency carrier signal with said higher frequency modulating signal to produce a resultant signal which is the product of said carrier signal and said modulating signal and is of the form A (1



+ MCOS wt) (COSΔwt), A and M being constants, w being equal to $2\pi f$ and αw being equal to $2\pi\Delta f$, and which has a frequency spectrum consisting of Δf, $f-\Delta f$, and $f+\Delta f$ in order of increasisng frequency; and

d. removing the carrier frequency component Δf by passing said resultant signal through a low-pass filter, whereby a modulated output signal is produced having only the frequency component $f-\Delta f$ and the frequency component $f+\Delta f$.

3,973,224

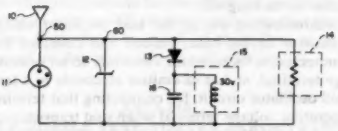
TANDEM CONFIGURATION FOR EMP PROTECTION

Gerhart K. Gaule, Elberon, and Paul Laplante, Eatontown, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 28, 1975, Ser. No. 625,979

Int. Cl.² H01P *1/22*; H04B *1/10*

U.S. Cl. 333—12 **4 Claims**



1. A pulse suppression circuit comprising:

a transmission line having an input and an output end and having three elements connected thereto, the first element being a gas ionization device, the second element being a metal oxide device and the third element being a clamping means, said elements connected across said transmission line and arranged in a tandem configuration in the order named with the gas ionization device closest to the input end of said coaxial line, said elements being spaced sufficiently electrically distant from each other so that the propagation time between elements of an undesired pulse introduced at the input end of the line is greater than the activation time of the preceding element.

3,973,225

FEATHER-EDGE PHASE SHIFTER

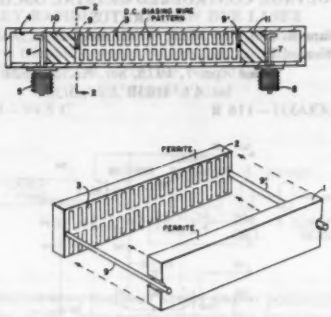
Marion E. Hines, Weston, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 29, 1975, Ser. No. 609,317

Int. Cl.² H01P *1/40*

U.S. Cl. 333—24.1 **1 Claim**

1. A phase shifter comprising a hollow conducting waveguide; wire means; two pieces of ferrite magnetic material sandwiching said wire means and being inserted in said waveguide; source means connected to said wire means so as to provide magnetization of said magnetic materials; means to launch a high frequency wave through said waveguide for phase shifting of said wave; said wire means is a feather-edge conductive surface pattern, said two magnetic materials are bar means; said wire means is a printed circuit deposited on one of the bars; first and second blocks of high dielectric



constant materials inserted at opposite ends of said bar means; and said means to launch the high frequency wave through the waveguide also transmittes the wave through one of said blocks of materials, then through said bar means, and then through the other block of high dielectric constant material.

3,973,226

FILTER FOR ELECTROMAGNETIC WAVES

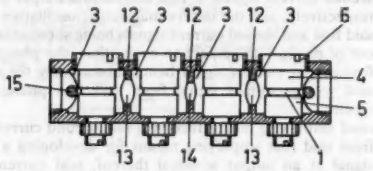
Peter Affolter, Unterehrendinge, and Alfred Koch, Untersiggenthal, both of Switzerland, assignors to Patelhold Patentverwertungs- und Elektro-Holding AG, Glarus, Switzerland

Filed July 12, 1974, Ser. No. 488,172

Claims priority, application Switzerland, July 19, 1973, 10546/73

Int. Cl.² H01P *1/20, 7/06*; H03H *7/10*

U.S. Cl. 333—73 R **36 Claims**



1. In a filter for electromagnetic waves of the type having shielded dielectric resonators, an improved construction, comprising a tubular filter shield, a plurality of coupled dielectric resonators in said shield, and mechanical elements comprising partitions, each having an opening therein, for decreasing the coupling coefficient positioned between adjacent coupled dielectric resonators.

3,973,227

TRANSMISSION LINE FOR TDM COMMUNICATION SYSTEM

Paolo Erculiani, Milan, Italy, assignor to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Division of Ser. No. 369,731, June 13, 1973, Pat. No. 3,878,485. This application Feb. 10, 1975, Ser. No. 548,675

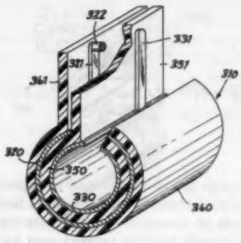
Claims priority, application Italy, June 15, 1972, 25734/72; June 15, 1972, 25735/72; June 15, 1972, 25733/72

Int. Cl.² H01P *3/06, 5/08*

U.S. Cl. 333—97 R **1 Claim**

1. A transmission line for a time-division-multiplex communication system, comprising a plurality of parallel conductor strips, a solid insulating layer of substantially nonpolarizable dielectric material interposed between said strips, and a die-

lectric outer layer extending along one of said strips on the side opposite said interposed insulating layer, the maximum thickness of said strips being substantially equal to the magnitude of the penetration depth of an alternating current at a

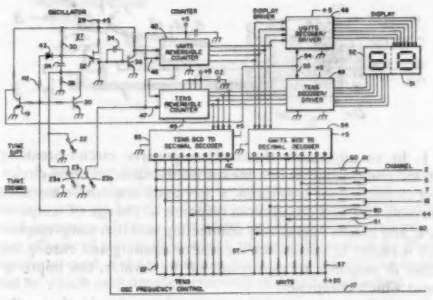


frequency of one KHz, said strips and said layers being concentrically curved about a common axis, said layers forming a pair of radially outwardly extending parallel fins, said strips being provided with a pair of radially extending parallel tongues on opposite sides of one of said fins.

3,973,228
ELECTRONIC TUNER CONTROL SYSTEM

David J. Mueller, Northlake, and Hugh F. Bonney, Des Plaines, both of Ill., assignors to Quasar Electronics Corporation, Franklin Park, Ill.

Filed Sept. 4, 1974, Ser. No. 503,107
Int. Cl.² H03J 1/22; H03H 5/12
U.S. Cl. 334—15 13 Claims



1. An electronic tuner control system including in combination:

a gated clock pulse generator for producing clock pulses at least one frequency on an output thereof;

control means energizable for initiating and maintaining operation of said gated clock pulse generator to cause said clock pulse generator to produce said clock pulses in response thereto and to terminate production of said clock pulses upon de-energization of said control means;

a plurality of tuning signal selecting means, at least some of which are settable for producing first tuning signals in a first predetermined range indicative of a preferred setting of tuning signals, and capable of producing second signals in a second predetermined range indicative of non-preferred tuning signals;

an analog tuning output terminal;

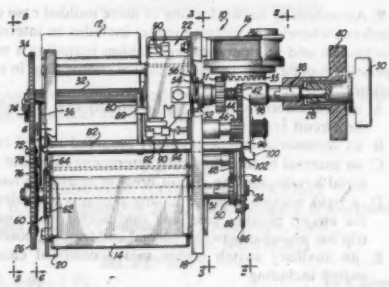
means coupled with the output of said gated clock pulse generator and response to said clock pulses for sequentially causing different ones of said plurality of tuning signal selecting means to be coupled with said analog tuning output terminal to control the tuning signal in said first and second predetermined ranges produced on said output terminal;

overriding means having an input coupled with said analog tuning output terminal and responsive to signals appearing on said output terminal, and further coupled with said gated clock pulse generator for overriding said control means and maintaining operation of said gated clock pulse generator for so long as an input signal to said overriding means is within said second predetermined range of signals and for terminating operation of said gated clock pulse generator following de-energization of said control means when the input signal to said overriding means is in said first predetermined range of signals.

3,973,229
COMBINED 82-POSITION UHF AND VHF TELEVISION TUNER WITH MEMORY FINE TUNING

Morton L. Weigel, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Filed Jan. 2, 1975, Ser. No. 537,841
Int. Cl.² H03J 1/02, 3/12
U.S. Cl. 334—86 14 Claims



1. A combination tuner comprising:

a first tuner tunable over a first predetermined frequency band;

a second tuner tunable over a second predetermined frequency band;

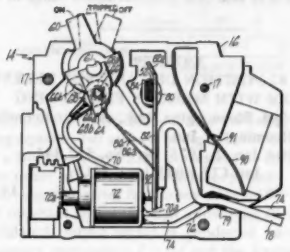
a selector shaft; and

means coupling said selector shaft to said first and second tuners, said coupling means including means for operatively coupling said selector shaft to said first tuner over a predetermined range of rotation of said selector shaft for tuning said first tuner over the entire first predetermined frequency band and for operatively coupling said selector shaft to said second tuner for a second predetermined range of rotation of said selector shaft for tuning said second tuner over said entire second predetermined frequency band, said coupling means including a first gear rotatable by said selector shaft, a second gear coupled to one of said tuners and engaging said first gear, means for disengaging said first and second gears and a third gear rotatable by said selector shaft, said third gear having means associated therewith for rendering said disengaging means operative to disengage said first and second gears only in a single predetermined position of said selector shaft, wherein said disengaging means includes an arm member affixed to one of said first and second gears and a retractable pin member affixed to the other one of said first and second gears, said third gear being operative to extend and retract said retractable pin.

3,973,230
CIRCUIT BREAKER ACCESSORIES INCORPORATING IMPROVED AUXILIARY SWITCH

Ronald David Ciarcia, Bristol, and James Edward McGann, Jr., Plainville, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Apr. 25, 1974, Ser. No. 571,736
Int. Cl.² H01H 75/00
U.S. Cl. 335—13 14 Claims



9. An accessory device for one or more molded case circuit breakers, wherein the circuit breaker includes an internal trip mechanism and an operating mechanism including a manual operating handle, said accessory device comprising, in combination:

A. an accessorial case affixed in side-by-side relation with the circuit breaker;

B. an accessorial handle pivotally mounted in said case;

C. an external handle tie rigidly interconnecting said accessorial handle and the circuit breaker operating handle;

D. a rigid internal trip bar having portions extending into the circuit breaker case and said accessorial case; said trip bar movable between normal and tripping positions;

E. an auxiliary switch within said accessorial case, said switch including

1. a first contact variously positioned by said accessorial handle in following, via said handle tie, the movement of the circuit breaker handle, and

2. a second contact variously positioned by said trip bar in assuming said normal and tripping positions; and

F. first and second auxiliary circuit leads extending into said accessorial case, said first lead electrically connected to said first switch contact and said second lead electrically connected to said second switch contact,

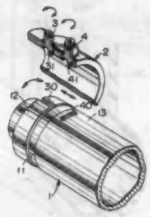
G. whereby said switch is effective to selectively control the energization of the auxiliary circuit in accordance with the relative positions of said accessorial handle and said trip bar.

3,973,231
POSITION ADJUSTING DEVICE FOR IMAGE PICKUP TUBE COIL ASSEMBLY

Takemi Saito, Kawagoe, and Shoji Itoya, Tokyo, both of Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Aug. 18, 1975, Ser. No. 605,653
Claims priority, application Japan, Aug. 27, 1974, 49-98254
Int. Cl.² H01F 7/00
U.S. Cl. 335—210 7 Claims

1. A device for adjusting the position of an image pickup tube with respect to an optical system for forming an image to be focused on the face of said image pickup tube comprising a coil assembly fixed to the image pickup tube, said coil assembly having a cylindrical body in which said image pickup tube is inserted with the face of the tube being exposed at one end of the coil assembly; a holder fixed to the optical system for forming the image to be focused on said face of the image pickup tube, said holder being cylindrical in shape and said coil assembly being inserted therein with its outer surface fitted with the inner surface of said holder, the outer surface of said coil assembly being provided with a longitudinally extending groove and a laterally extending groove; and adjusting pins rotatably mounted to said holder, said pins each

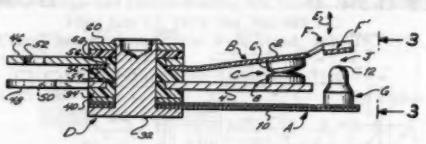


having an eccentric pin portion to be engaged with said longitudinally extending groove and said laterally extending groove respectively, whereby the longitudinally and angular position of the coil assembly relative to the holder are adjusted by rotating said adjusting pins.

3,973,232
ADJUSTABLE THERMALLY-RESPONSIVE CIRCUIT-BREAKING DEVICE

Colin D. Hickling, Woodstock, N.Y., assignor to American Thermostat Corporation, South Cairo, N.Y.

Filed May 30, 1975, Ser. No. 582,257
Int. Cl.² H01H 61/08
U.S. Cl. 337—94 21 Claims



1. In an adjustable thermally-responsive circuit-breaking device comprising: switch means positionable in open-circuit and closed-circuit conditions, a thermally-responsive member movable in a first direction in response to change of temperature, and means operatively connecting said thermally-responsive member to said switch means for opening and closing the latter in response to movement of the former, the improvement which comprises:

means mounting said switch means and said thermally-responsive member for relative adjustable positioning in a second direction different from said first direction,

means sensitive to said relative adjustable positioning and effective to modify the action of said connecting means in response to the sensed relative positioning so as to cause said switch means to be shifted from one of its conditions to the other at different points along said first direction for different of said relative positionings.

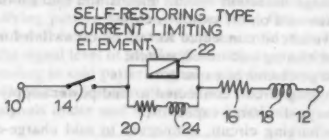
3,973,233
CIRCUIT INTERRUPTER

Toshio Miyamoto; Teijiro Mori, both of Amagasaki; Kiyoshi Matsuura, and Bungo Hara, both of Fukuyama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 13, 1974, Ser. No. 506,191
Int. Cl.² H01H 87/00
U.S. Cl. 337—118 5 Claims

1. A circuit interrupter comprising, in combination, at least one pair of relatively separable contacts, a self-restoring type current limiting element and a first electromagnetic trip means connected in series circuit relationship with said

contacts, a resistor connected across said self-restoring type current limiting element, and second electromagnetic trip means connected in a circuit with said resistor, said first and



second electromagnetic trip means being operative independently to trip said contacts, said second electromagnetic trip means being operative only in response to the operation of said self-restoring type current limiting element.

3,973,234

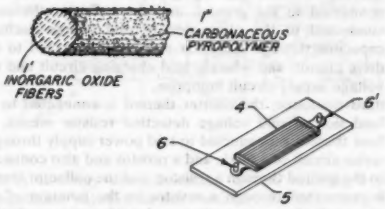
PRECISION TYPE RESISTOR

Karl J. Youtsey, Chicago; William C. Holt, Jr., Prospect Heights; Robert D. Carnahan, Barrington, and David H. Spielberg, Schaumburg, all of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Oct. 8, 1974, Ser. No. 513,026

Int. Cl.² H01C *1/012*

U.S. Cl. 338—226 **4 Claims**



1. A precision high resistance resistor comprising a parallel grouping of a plurality of semiconducting fibers of refractory inorganic oxide having a carbonaceous pyropolymer thereon, said grouping of fibers extending unidirectionally between a pair of spaced terminals to which the end portions of the fibers are connected, and a supporting base of non-conductive material to which said parallel grouping of fibers is attached.

3,973,235

DEVICE FOR THE DETECTION OF AN ACOUSTIC IMAGE

Cornelis Martinus van der Burgt, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

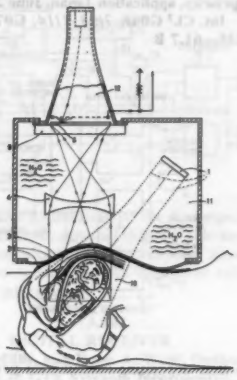
Filed Apr. 15, 1974, Ser. No. 461,017

Claims priority, application Netherlands, Apr. 24, 1973, 7305667

Int. Cl.² H01J *31/495*

U.S. Cl. 340—5 MP **9 Claims**

1. An electron vacuum tube comprising a face plate which is capable of withstanding the pressure difference between the inside and outside of the tube and which is made of a polymer material having a low velocity of acoustic propagation, a transducer for converting an acoustic image into a corresponding electric charge image and located inside of the tube adjacent the face plate, said transducer being formed of a stretched thin foil made of a polymer material which also has a low velocity of acoustic propagation and has a remanent electrical polarization, the velocity of acoustic propagation of the face plate and transducer material each being less than 1.8 times that of a liquid medium used to image the acoustic wave image onto the transducer via said face plate, the transducer being thinner than the face plate and approximately 0.5 times



the acoustic wavelength, and means for electronically scanning the transducer charge image.

3,973,236

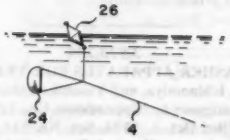
HORIZONTAL HYDROPHONE ARRAY

Robert B. McLaughlin, La Jolla, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Dec. 23, 1974, Ser. No. 535,831

Int. Cl.² G01V *1/38*

U.S. Cl. 340—7 PC **11 Claims**



1. A marine seismic detector array comprising:

a tether line, one end of said tether line terminating in a bridle,

a first and second elongated hydrophone array, one end of each of said elongated hydrophone arrays terminating at said bridle,

a first and second maneuverable drogue chute, said first drogue chute attached to the other end of said first hydrophone arrays and said second drogue chute attached to the other end of said second hydrophone array, said drogue chutes oriented to maintain the predetermined angle between the said arrays,

a first buoyancy means and a first weight means, said first buoyancy means and said first weight means attached to said first drogue chute for maintaining said first drogue chute at a predetermined depth,

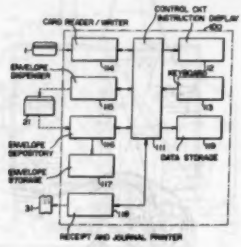
a second buoyancy means and a second weight means, said second buoyancy means and said second weight means attached to said second drogue chute for maintaining said second drogue chute at a predetermined depth.

3,973,237

ARTICLE DEPOSITING MACHINE

Yoji Sawaguchi, Tokyo; Koichi Suzuki, Kawasaki, and Katsumasa Ogawa, Yokohama, all of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Filed June 14, 1974, Ser. No. 479,518
Claims priority, application Japan, June 28, 1973, 48-73031
Int. Cl.² G06K 7/08, 1/14; G07F 1/06
U.S. Cl. 235—61.7 B 19 Claims



1. An article depositing machine for performing automatic deposit transaction operations in conjunction with verification of customer identification, comprising:

means for entering customer identification information,

means responsive to said customer identification information entered by said entering means, for checking the validity of said information and producing an authorization output for enabling a deposit transaction in response to such entered customer identification information being valid,

means responsive to said authorization output of said checking means for issuing an article container to the customer, said article container including means for receiving and sealing therein a desired article to be deposited, and

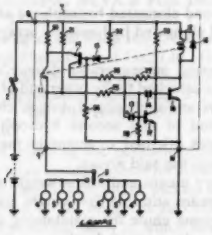
receiving and storing means operable in response to said authorization output of said enabling means for receiving said article container by deposit therein, and storing said deposited article container.

3,973,238

FLASHER APPARATUS FOR VEHICLE

Minoru Kato, Ichinomiya, and Yasuhiko Sakurai, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Aichi, Japan

Filed Oct. 1, 1974, Ser. No. 511,481
Claims priority, application Japan, Oct. 11, 1973, 48-114095
Int. Cl.² B60Q 1/46
U.S. Cl. 340—81 R 7 Claims



1. A flasher apparatus for a vehicle comprising,

a power supply,

a plurality of lamps, each of said lamps being connected in parallel,

a power supply circuit including a voltage detection resistor means and an on-off switch, for supplying power from said power supply to each of said lamps through said voltage detection resistor means and said on-off switch, when said on-off switch is closed,

a drive circuit connected to said on-off switch for opening and closing said on-off switch,

a charge-discharge capacitor,

a charging circuit connected to said power supply and said charge-discharge capacitor,

a discharging circuit, connected to said charge-discharge capacitor and said drive circuit, for producing an output signal for driving said drive circuit,

a voltage supply circuit connected to said voltage detection resistor means and said discharging circuit for applying a predetermined voltage to said charge-discharge capacitor when the voltage drop of said voltage detection resistor means attains a threshold voltage owing to at least one of said plurality of lamps burning out, thereby to reduce the charging and discharging time of the charge-discharge capacitor so that the flashing cycle of the lamps not burned out can become faster than the flashing cycle when none of said plurality of lamps is burned out,

wherein said discharging circuit comprises,

a first transistor, the base thereof is connected to one side of said charge-discharge capacitor, and the emitter thereof is connected to the ground,

a second transistor, the base thereof is connected to the collector of said first transistor, the emitter thereof is connected to the ground, and the collector thereof is connected to the other side of said charge-discharge capacitor through a resistor and also connected to said drive circuit, and wherein said charging circuit and said voltage supply circuit comprise,

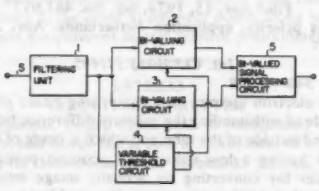
a third transistor, the emitter thereof is connected to the load side of said voltage detection resistor means, the base thereof is connected to said power supply through a series circuit of a diode and a resistor and also connected to the ground through a resistor, and the collector thereof is connected through a resistor to the junction of said charge-discharge capacitor and said resistor which is connected between said charge-discharge capacitor and said collector of said second transistor.

3,973,239

PATTERN PRELIMINARY PROCESSING SYSTEM

Shigeru Kakumoto, Kokubunji; Toshihiro Hananoi, Kanagawa, and Hirohide Endou, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 15, 1974, Ser. No. 515,075
Claims priority, application Japan, Oct. 17, 1973, 48-115813; Mar. 1, 1974, 49-23328; Mar. 29, 1974, 49-34439
Int. Cl.² G06K 9/12
U.S. Cl. 340—146.3 AG 8 Claims



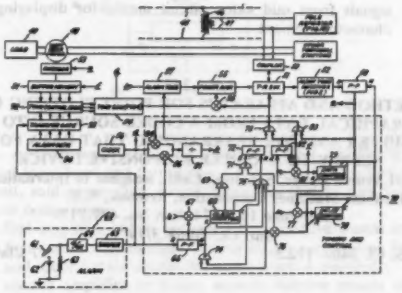
1. A pattern preliminary processing system comprising filtering means for filtering pattern signals by means of a mask, the weight of the respective regions on the mask being nearly symmetrical with respect to the center of the mask and the total weight of all regions of the mask being nearly zero so as

to emphasize the variations in shade along the boundary between the pattern and background, first bi-valuing means for dividing the output of said filtering means into two values at a first threshold level, second bi-valuing means for dividing the output of said filtering means into two values at a second threshold level lower than said first threshold level, and means for classifying pattern signals between said first and second threshold levels into a first state and a second state by reference to the signal level of small regions adjacent to the regions corresponding to said pattern signals, said first state including signals above said first threshold level, said second state including signals under said second threshold level.

3,973,240
POWER LINE ACCESS DATA SYSTEM

Kouan Fong, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 5, 1974, Ser. No. 529,998
Int. Cl.² H04M *11/04*; H04Q *11/00*
U.S. Cl. 340—151 **13 Claims**



1. A two-way communication system utilizing a power transmission network as the medium for transmitting intelligence comprising:

a central station;

a plurality of terminal stations;

a plurality of repeaters interconnecting said central station and said terminal stations in a multi-level, tree-like network; wherein

said repeaters are individually addressed and said terminal stations are polled by groups, each said group of terminal stations being coupled to a single repeater at the lowest level of repeaters

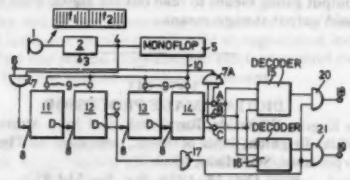
and said system utilizes tone code signaling in which one tone pattern has priority access to said central station.

3,973,241
INFORMATION TRANSMISSION SYSTEM

Wulf-Christian Streckenbach, Hemmingen, and Kurt Knuth, Hannover, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H, Frankfurt am Main, Germany

Filed June 18, 1975, Ser. No. 588,177
Claims priority, application Germany, June 18, 1974, 2429066; Nov. 16, 1974, 2454463
Int. Cl.² H04B *1/06*
U.S. Cl. 340—167 A **25 Claims**

1. In an ultrasonic system for conveying information by means of a first ultrasonic signal having a first frequency and a second ultrasonic signal following the first signal in time and having a second frequency different from the first frequency, the system including a transmitter and a receiver for the ultrasonic signals and being arranged to cause the moment of termination of the first signal to occur in a selected one of a succession of time regions each occupying a defined time interval from the start of the first signal, the time region in which the first signal terminates representing the value of a first item of information, the improvement comprising means connected in said system to cause each such time region to be constituted by a succession of time channels each representing a respective value of a second item of information and to

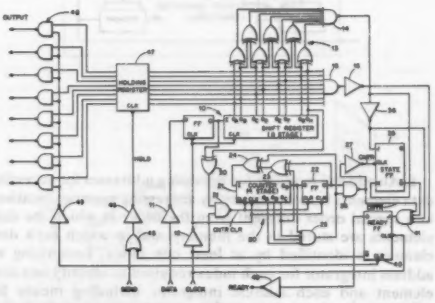


cause the moment of termination of the first signal to occur within that time channel representing the selected value of such second item of information, whereby the duration of the first signal completely identifies the respective values of two different items of information.

3,973,242
DIGITAL RECEIVER

Robert G. Field, Millis, and Donn A. Wahl, Dedham, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Feb. 27, 1975, Ser. No. 553,467
Int. Cl.² H04Q *9/16*
U.S. Cl. 340—168 B **5 Claims**



1. Digital receiving apparatus comprising

input storage means for receiving and storing digital words;

detection means coupled to said input storage means for detecting the presence or absence of particular digital code words stored in said input storage means;

counting means coupled to said input storage means for determining when said input storage means has received a predetermined number of identical digital words in succession;

first control means coupled to said detection means and to said counting means for producing an indication in response to a determination that said predetermined number of identical particular digital code words have been received by said input storage means;

second control means coupled to said detection means, to said counting means, and to said first control means for producing an indication in response to said detection means detecting the absence of said particular digital code words being stored in the input storage means, said counting means determining that the input storage means has received said predetermined number of identical digital words in succession, and said first control means producing an indication;

output storage means coupled to said input storage means and to said second control means for receiving and storing a digital word stored in the said input storage means

in response to an indication from said second control means;

output gating means coupled to said output storage means, and

output control means for applying a readout signal to said output gating means to read out the digital word stored in said output storage means.

3,973,243

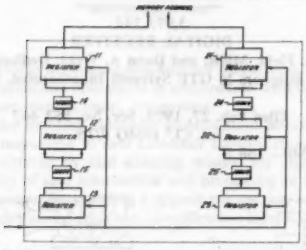
DIGITAL IMAGE PROCESSOR

Arliss Eugene Whiteside, Royal Oak, and John Aubrey Hornbuckle, Brighton, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Oct. 15, 1974, Ser. No. 514,872

Int. Cl.² G06F *9/20*

U.S. Cl. 340—172.5 **17 Claims**



1. An address modifier for providing addresses for accessing data elements from a memory by addressing memory locations in a special order different from the order in which the data elements are stored in the memory and in which each data element is identified by at least one index, comprising an address integrator for each index required to identify one data element and each address integrator including means for computing one identifying index of each data element, means for initially loading the address integrators with address information, and means connected to the address integrators and providing signals for controlling the address integrators for providing addresses sequentially in the special order for accessing the memory.

3,973,244

MICROCOMPUTER TERMINAL SYSTEM

Lawrence R. Lovercheck, Palo Alto; Russell K. Hileman, and Richard W. Calfee, both of San Jose, all of Calif., assignors to Zentec Corporation, Santa Clara, Calif.

Filed Feb. 27, 1975, Ser. No. 553,654

Int. Cl.² G06F *3/00*

U.S. Cl. 340—172.5 **38 Claims**

1. An information terminal system comprising:

a. a memory storing character data;

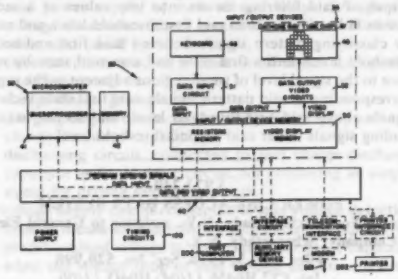
b. data means for entering character data into said memory;

c. a first set of shift registers receiving character data from said memory for storage therein;

d. a second set of shift registers receiving character data from said first set of shift registers for storage therein;

e. video circuit means receiving character data from said second set of shift registers for producing video signals; and

f. means including a character display receiving said video



signals from said video circuit means for displaying a character element.

3,973,245

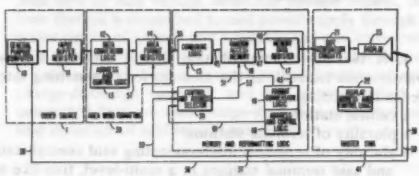
METHOD AND APPARATUS FOR POINT PLOTTING OF GRAPHICAL DATA FROM A CODED SOURCE INTO A BUFFER AND FOR REARRANGING THAT DATA FOR SUPPLY TO A RASTER RESPONSIVE DEVICE

Karl Arnold Belser, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 10, 1974, Ser. No. 477,717

Int. Cl.² G06F *3/14*

U.S. Cl. 340—172.5 **7 Claims**



1. An apparatus for the point plotting of graphical data from a coded source (1) into a word addressable memory (16) and for rearranging that data for supply from the memory to a raster responsive device (41), the coded data representative of line segments or other symbols in the form of a sequence of X, Y coordinate values, the apparatus comprises:

means (12, 13) for point plotting the coordinate values defining each line segment into a corresponding predetermined rectangular subarray (FIG. 1–14; FIG. 6A);

means (FIG. 1–15, 17, 43, 20; FIG. 3B; FIG. 5B; FIG. 6C) for storing of the given rectangular subarray into the memory (16) and for the formatting (13, 14) of a new rectangular subarray upon the point plotting of coordinate values dimensionally exceeding the previously generated subarray;

means (FIG. 1–18, 19, 17, 43, 51; FIGS. 3A, 6B, 10–12) for reformatting the rectangular subarrays in the memory into linear arrays by mapping the bits constituting the same row or column from each subarray of a set of topologically adjacent rectangular subarrays into a linear array, the counterpart linear arrays being reinserted into the memory; and

means (FIG. 1–41, 22, 59, 20, 53) for extracting the linear arrays from the memory and serially applying them to the raster responsive device.

3,973,246

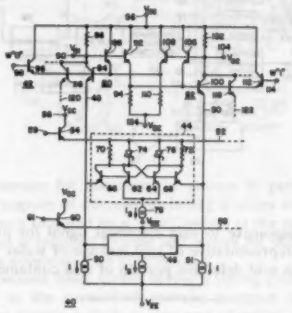
SENSE-WRITE CIRCUIT FOR BIPOLAR INTEGRATED CIRCUIT RAM

Michael S. Millhollan, Mesa, and Ronald L. Treadway, Scottsdale, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 428,153, Dec. 26, 1973. This application July 11, 1975. Ser. No. 595,241

Int. Cl.[2] G11C *11/44*

U.S. Cl. 340—173 FF 2 Claims



1. A sense-write circuit for detecting and amplifying a stored logic level and for writing a logic level into a storage circuit, said sense-write circuit being coupled to said logic circuit comprising:

a first amplifier circuit including first resistive means and first and second electron control means each having first and second main electrodes and a control electrode;

a second amplifier including second resistive means and third and fourth electron control means each having first and second main electrodes and a control electrode;

said first resistive means being coupled between a first voltage conductor and an output node of said first amplifier circuit, and first electron control means having a first main electrode coupled to said output node of said first amplifier circuit and said second main electrode connected to a sense-write conductor, said second electron control means being coupled between said first voltage conductor and said control electrode of said first electron control means and having its control electrode coupled to said output node of said first amplifier circuit;

said third electron control means and said second resistive means being coupled in series between said first voltage conductor and said second voltage conductor, said control electrode of said third electron control means being coupled to said output node of said first amplifier circuit;

said third resistive means being coupled between said first voltage conductor and an output node of said second amplifier circuit, said fourth electron control means being coupled between said output node of said second amplifier circuit and a second sense-write conductor, said fifth electron control means being coupled between said first voltage conductor and said control electrode of said fourth electron control means and having its control electrode coupled to said output node of said second amplifier circuit;

said sixth electron control means and said fourth resistive means being coupled in series between said first and second voltage conductors, said control electrode of said sixth electron control means being coupled to said output node of said second amplifier circuit;

an input circuit having an input node for receiving a write input signal, said write input circuit being coupled to said control electrode of said first electron control means and to said control electrode of said fourth electron control means;

said control electrode of said electron control means being coupled to said control electrode of said fourth electron control means;

said second main electrode of said sixth electron control means being coupled to said control electrode of said first electron controls means;

said first and second sense-write conductors being coupled to at least one storage circuit, said storage circuit including first and second cross-coupled electron control means and first and second resistive load means.

3,973,247

METHOD OF WRITING AND ERASING INFORMATION FOR ELECTROOPTIC CERAMIC MEMORIES

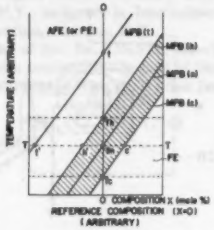
Akio Kumada, Kokubungi, and Koji Ishida, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

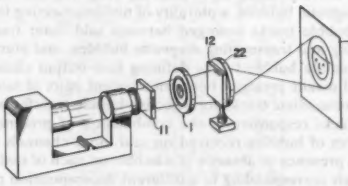
Filed Apr. 8, 1974, Ser. No. 459,123

Claims priority, application Japan, Apr. 6, 1973, 48-38696

Int. Cl.[2] G11C *11/22, 11/42*

U.S. Cl. 340—173.2 3 Claims





2. A method for writing information in an electrooptic ceramic plate composed of an electrooptic ceramic in which a ferroelectric and anti-ferroelectric or para-electric phase can coexist with a morphotropic phase boundary therebetween, said electrooptic ceramic formed from a solid solution of the following formula

$$Pb_{(1-x-\alpha)}La_xA_\alpha(Zr_{(1-y-\beta)}Ti_yM_\beta)\,1-\frac{x+\alpha}{4}\cdot O_3$$

wherein

$0 \leq x \leq 0.2$ $0 \leq y \leq 0.6$

$0 \leq \alpha < 1$ $0 \leq \beta \leq 1$

$0 \leq x+\alpha < 1$ and $0 \leq y+\beta \leq 1$

wherein A denotes at least one element selected from the group consisting of Mg, Ca, Sr, Ba, Sc, Y, Al, Ga, In, Tl, Sb, Bi, La, Ce, Nd, Sm, Eu, Gd, Tb, and Dy, M representing at least one element selected from the group consisting of Fe, Ni, Co, Hf, Si, Ge, Sn, J, Nb, and Ta, said electrooptic ceramic plate being entirely in the ferroelectric state, said electrooptic ceramic being maintained at a temperature intermediate the temperature T(h) generating the heating morphotropic phase boundary in said electrooptic ceramic and the temperature T(c) generating the limiting morphotropic phase boundary in said electrooptic ceramic, said method comprising

applying to said electrooptic plate an electric field reverse

in polarity to the spontaneous polarization of said electrooptic ceramic plate in accordance with the pattern of the desired information to be written into said electrooptic ceramic plate and simultaneously heating said electrooptic ceramic plate in accordance with said pattern by the current produced by said electric field to a temperature above $T(h)$ to thereby write said information into said electrooptic ceramic plate.

3,973,248

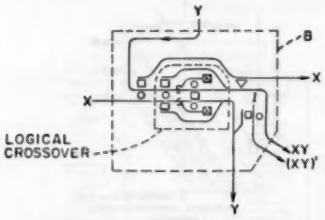
NON-CONSERVATIVE BUBBLE LOGIC CIRCUITS

Robert C. Minnick, P.O. Box 1892, Houston, Tex. 77001; Paul T. Bailey, 700 Rugby Court, Creve Coeur, Mo. 63141; Robert M. Sandfort, 831 Tilbury Lane, St. Charles, Mo. 63301, and Warren L. Semon, 12 Pebble Hill Road, DeWitt, N.Y. 13214

Division of Ser. No. 311,402, Dec. 1, 1972, Pat. No. 3,866,191. This application Sept. 20, 1974, Ser. No. 507,700

Int. Cl.[2] G11C *11/14*

U.S. Cl. 340—174 TF 13 Claims



1. A planar two-variable non-conservative magnetic bubble decoder, comprising a pair of outer magnetic bubble tracks having corresponding input ends for receiving and transmitting magnetic bubbles, a plurality of non-intersecting intermediate bubble tracks arranged between said outer tracks for receiving and transmitting magnetic bubbles, said plurality of intermediate bubble tracks defining four output channels, a control means arranged between adjacent pairs of said outer and intermediate tracks for affecting bubble transfer between said tracks responsive to the combination of presences and absences of bubbles received on said input channels to produce a presence or absence of a bubble on each of said output channels corresponding to a different decomposition product of the input variables associated with said input channels, said variables being represented by the presence or absence of bubbles at said input channels respectively.

3,973,249

APPARATUS FOR DETECTING LEAKAGE FROM CONTAINER AND METHOD THEREFOR

Takamasa Yokote, Kashihara, and Yoshitaka Kinouchi, Yao, both of Japan, assignors to Toyo Aluminium K. K., Osaka, Japan

Filed Feb. 20, 1975, Ser. No. 551,344

Claims priority, application Japan, Feb. 22, 1974, 49-21807; Dec. 28, 1974, 50-3325; Dec. 28, 1974, 50-3326

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—242 26 Claims

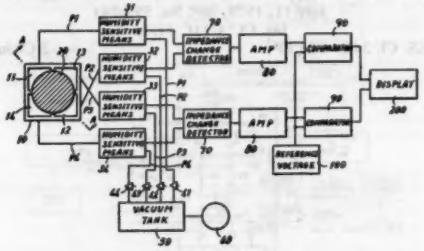
1. An apparatus for detecting leakage from a container which is filled with water-contained materials and hermetically sealed, comprising

means for enclosing said container for forming an enclosed space defined by said enclosing means and said container,

means for partitioning said enclosed space for forming a plurality of enclosed space cells,

means for causing a difference in pressure between the inside of said container and the inside of said enclosed space, whereby leakage of water molecules is caused through a defective portion of said container,

a plurality of means each being individually associated with said enclosed space cells for providing an electrical signal associated with the humidity inside of each of said enclosed space cells, and



means responsive to said electrical signal for providing a signal representative of said leakage of water molecules through said defective portion of said container.

3,973,250

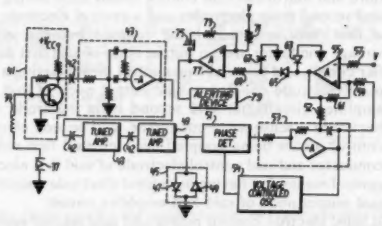
ACOUSTICALLY COUPLED BURGLAR ALARM SYSTEM

Malcolm R. Uffelman, 1808 Horseback Trail, Vienna, Va. 22180

Filed Nov. 12, 1974, Ser. No. 523,240

Int. Cl.[2] G08B *13/08*

U.S. Cl. 340—274 R 5 Claims



1. An entry alarm system for a building comprising:

gas powered means for generating an ultrasonic signal;

means for securing said means for generating an ultrasonic signal to a movable closure in said building whereby movement of said closure activates said gas powered generating means;

first means for detecting the signal output of said gas powered generating means and converting said ultrasonic signal into an electric signal;

a tuned amplifier coupled to the output of said first means for amplifying the said electrical signal;

second means coupled to the output of said tuned amplifier for reducing the influence of background noise in the frequency range of the output of said tuned amplifier;

third means coupled to the output of said second means for searching over the frequency range of the output of said tuned amplifier to determine the presence of said electric signal;

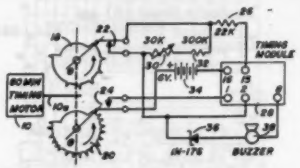
fourth means coupled to said third means for detecting the output of said third means; and

an alerting device coupled to the output of said fourth means.

3,973,251
TIMING DEVICE FOR EXERCISE PROGRAM WITH SIGNALLING MEANS

J. Larry Stephans, 216-30 117th Road, Cambria Heights, N.Y. 11411

Filed Apr. 25, 1975, Ser. No. 571,643
Int. Cl.² G08B 1/00
U.S. Cl. 340—309.1 7 Claims



1. Apparatus for instructing a patient to perform a prescribed program of exercise including a series of "exercise" periods each followed by a "rest" period at the start of which the patient is required to read and record his pulse rate, said apparatus comprising, in combination,

spring-wound timer means having a timing cycle at least as long as the prescribed exercise program and a timer motor having a shaft to one end of which is secured a winding knob which also serves as a pointer,

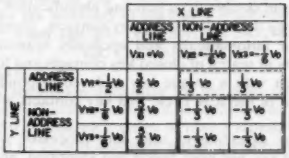
a dial supported in cooperative relationship with said knob, said dial being time-graduated in intervals corresponding to the intervals of the prescribed exercise program, and

signal generating means including cam-controlled switches operative in response to the operation of said timer means for generating first and second audible signals of predetermined durations at times synchronized with the time graduations on said dial, the first signal generated at the times corresponding to the start of a "rest" period having a duration equal to a sub-multiple of 60 seconds thereby establishing a period during which the patient reads his pulse which reading when multiplied by said multiple gives his pulse rate in beats per minute, and the second signal generated at the times corresponding to the start of an "exercise" interval having a duration substantially shorter than the first signal.

3,973,252
LINE PROGRESSIVE SCANNING METHOD FOR LIQUID CRYSTAL DISPLAY PANEL

Isamu Mitomo, Hachioji, and Tetsunori Kaji, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 22, 1974, Ser. No. 463,149
Claims priority, application Japan, Apr. 20, 1973, 48-44158
Int. Cl.² G09F 9/32
U.S. Cl. 340—324 M 6 Claims

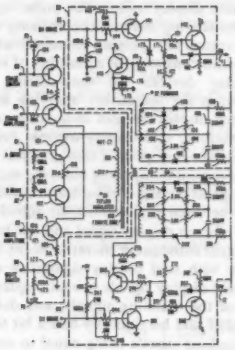


1. In a line progressive scanning and driving method including the step of applying line progressive scanning-electric quantities to respective ones of a first group of electrodes of a display panel which is constructed such that a plurality of display cells each having substantially symmetrical optical characteristics for positive and negative input electrical quantities are arrayed in the form of a matrix, and the step of applying electrical quantities, corresponding to an information to-be-displayed, to respective ones of a second group of electrodes of said display panel, the improvement comprising the steps of adjusting the levels of said electrical quantities in an address period and in a nonaddress period as applied to said respective ones of said second group of electrodes to be substantially symmetrical to levels of said electrical quantities in a nonaddress period as applied to said respective ones of said first group of electrodes, the difference between said levels in said address period and in said nonaddress period, of said electrical quantities applied to said respective ones of said first group of electrodes being at least twice as large as the difference between said levels in said address period and in said nonaddress period, of said electrical quantities applied to said respective ones of said second group of electrodes.

3,973,253
FLOATING ADDRESSING SYSTEM FOR GAS PANEL

Tony N. Criscimagna, Woodstock, and Albert O. Piston, Catskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 238,572, March 27, 1972, abandoned, and a continuation-in-part of Ser. No. 885,086, Dec. 15, 1969, abandoned. This application Jan. 10, 1974, Ser. No. 432,279
Int. Cl.² H01J 17/48
U.S. Cl. 340—324 M 13 Claims



1. In a gas discharge device comprising a pair of support plates having dielectric coated conductor arrays thereon said conductor arrays being oriented relative to each other to define a plurality of separately addressable discrete discharge sites, the improvements comprising,

circuit means for supplying a periodic sustaining potential to all said conductor arrays,

logic circuit and high voltage pulse producing means referenced to said periodic sustaining potential for selectively generating high voltage pulses and algebraically adding same to said periodic sustaining potential on selected ones of said conductors in said arrays,

and means for providing low voltage address control signals to said logic circuit means for controlling said high voltage pulse producing means.

3,973,254

ARRANGEMENT FOR A DYNAMIC DISPLAY SYSTEM

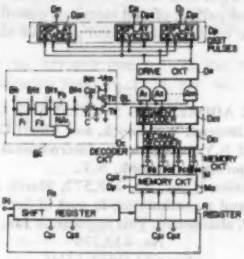
Kosei Nomiya, Tokyo, and Takao Tsuiki, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 22, 1972, Ser. No. 317,775

Claims priority, application Japan, Dec. 22, 1971, 46-103712

Int. Cl.² G09F 9/32

U.S. Cl. 340—336 7 Claims



1. In a dynamic display system for pulse lighting display devices in a time-sharing manner, comprising a plurality of display devices, means for applying consecutive timing signals having a pulse width consisting of a plurality of bit times to the respective display devices for time-sharing energization thereof, and means for selectively applying indicia display signals to selected display devices to actuate said devices in selected combinations, said display devices being energized only upon coincident receipt of a timing signal and a display signal, the improvement comprising blanking means for generating blanking signals having a pulse width sufficient to cover the border time between adjacent display signal including the trailing portion of each display signal and the leading portion of the display signal subsequent thereto, means for gating said blanking signals with said display signals so as to prevent application of said display signals to said display devices during the period of the blanking signals, and delay means for delaying the last of said bit times by half a bit time, the pulse width of said blanking signals being equal to one bit time.

3,973,255

TOUCH RESPONSIVE KEYBOARD APPARATUS

Alfred B. Freeman, 20418 Seaboard Road, Malibu, Calif. 90265

Continuation-in-part of Ser. No. 348,304, April 5, 1973. This application Dec. 24, 1974, Ser. No. 536,172

Int. Cl.² G08C 1/00

U.S. Cl. 340—365 E 2 Claims

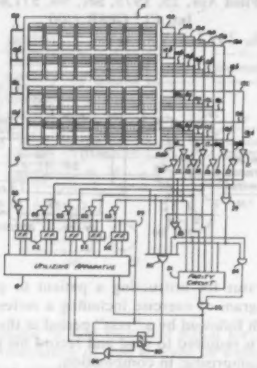
1. In a keyboard apparatus for input of information to a utilizing apparatus, the combination of:

a. a set of conductors arranged in different combinations in each of a plurality of areas;

b. means responsive to an operator for energizing those of said conductors in the combination located in any selected one of said areas;

c. a particular conductor exposed in each of said areas in a location in which said particular conductor will be the last contacted by said energizing means;

d. means connected to said particular conductor for determining when said particular conductor is energized; and



e. means operated by said determining means for coupling said conductors to said utilizing apparatus.

3,973,256

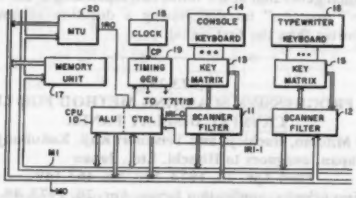
KEY DETECTION SYSTEM INTERCONNECTING KEYBOARD AND DATA PROCESSING SYSTEM

Wolfgang R. Stoesser, Santa Susanna; Connable F. Wills, Venice, and Irving Sperling, Santa Monica, all of Calif., assignors to Compucorp, Los Angeles, Calif.

Filed July 14, 1975, Ser. No. 595,510

Int. Cl.² G08C 1/00

U.S. Cl. 340—365 E 10 Claims



5. Apparatus for automatically scanning a keyboard for the purpose of detecting depressed keys in the order depressed and presenting a key identifying code to a data processing system without double detection and identification of a single depressed key due to bouncing key contacts, comprising

means for automatically and cyclically scanning all key contacts in search of closed key contacts and for identifying each with a unique key code corresponding to the position in the scan cycle that key contacts are detected closed,

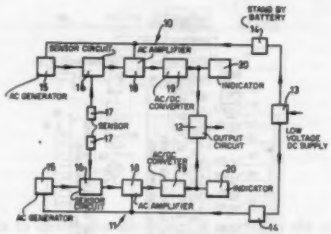
means for signalling to said data processor when a depressed key has been found and identified, and

means for filtering out any bounce in key contacts closing before actuating said signalling means upon a key being depressed including means for counting up to a predetermined number of scan cycles the same key contacts are detected closed and counting down each scan cycle the same key contacts are not detected closed before actuating said signalling means.

3,973,257
APPARATUS FOR DETECTING CHANGES IN THE ELECTRICAL CHARACTERISTICS OF SENSOR DEVICES

Anthony William Rowe, Southampton, England, assignor to Dreamland Electrical Appliances Limited, England

Filed Jan. 23, 1975, Ser. No. 543,311
Claims priority, application United Kingdom, Jan. 29, 1974, 4040/74
Int. Cl.² G08B 19/00
U.S. Cl. 340—418 5 Claims



1. Apparatus for detecting changes in the electrical characteristics of sensor devices comprising, in combination, an output circuit, a plurality of electrical circuits each connected to said output circuit, each of said plurality of electrical circuits comprising an AC generator, a sensor circuit serially connected to said AC generator, an AC amplifier serially connected to said sensor circuit, said sensor circuit being connectable to a sensor device whereby a change in an electrical characteristic of said sensor device will cause a change in output from said sensor circuit, an AC/DC converter having an input connected to an output of said AC amplifier and having an output for providing a DC output voltage, whereby either a change in said electrical characteristic of said sensor device to beyond a predetermined value or a fault in said electrical circuit will cause said DC output voltage at the output of said AC/DC converter to lie beyond a predetermined value, and indicator means connected to the output of said AC/DC converter, said outputs of all of said AC/DC converters being connected to said output circuit and said output circuit being arranged to provide an output signal when said DC output voltages at the outputs of all of said AC/DC converters lie beyond said predetermined value.

3,973,258
TRANSIENT EVENT DATA ACQUISITION APPARATUS FOR USE WITH RADAR SYSTEMS AND THE LIKE

Todd A. Cerni, and Edmund Philip Krider, both of Tucson, Ariz., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 24, 1975, Ser. No. 543,745
Int. Cl.² G01S 9/60
U.S. Cl. 343—5 W 14 Claims

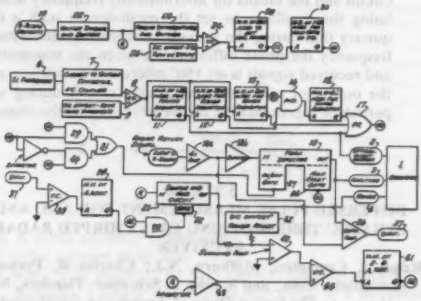
1. Data acquisition apparatus for use with radar-type systems having a transmitter driven at a particular pulse repetition rate for producing a series of return signals from targets illuminated by each transmitted pulse, said apparatus providing real-time processing of preselected transient-event targets of a type capable of producing return signals initially greater than other signals in each of said return signal series, comprising:

resettably-gated peak detector means trackably acquiring the peak value present in each of said return signal series from one transmitter pulse and holding said peak value until the next transmitter pulse, said held value being produced as a peak detector output signal,

transient event detector means generating an output signal marking the occurrence of each of said preselected transient events,

sample and hold means triggered by said transient event output signal for producing an output signal representing the range of the transient event and for holding said output signal for a predetermined period of time, and

peak detector control means coupled to the output of said sample and hold means for gating said peak detector into



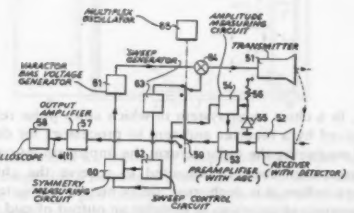
"ON" and "OFF" modes with the "ON" mode centered about the range of said transient event and having a short duration period relative to said transmitter pulse repetition rate whereupon said peak detector samples each series of return signals only during said "ON" period for providing the amplitude of said transient event signal,

said hold periods of said peak detector and said sample and hold means facilitating the recording of the transient event amplitude and range.

3,973,259
DEVICE FOR INDICATING CHANGES IN THE POSITION OF AN OBJECT

Gösta Hellgren, Jungfrusundsvagen 17, 170 10 Ekero, and Gunnar Wahlsten, Vedettvagen 22 A, 183 52 Taby, both of Sweden

Filed Nov. 4, 1974, Ser. No. 520,944
Claims priority, application Sweden, Nov. 12, 1973, 7315257
Int. Cl.² G01S 7/40, 9/04
U.S. Cl. 343—7.5 3 Claims



1. A device for indicating vibrations of an object comprising

a signal transmitter including an oscillator for emitting electromagnetic signals toward the object,

a receiver for receiving reflections of the transmitted signals from the object,

a phase comparing circuit energized in accordance from the transmitted and received signals respectively to provide an output signal indicative of the phase relationship therebetween,

indicating means for connection to said phase comparing circuit,

means for intermittently frequency modulating the oscillator of said signal transmitter by a symmetric sweep signal over a frequency range small compared to the frequency of the transmitted signal,

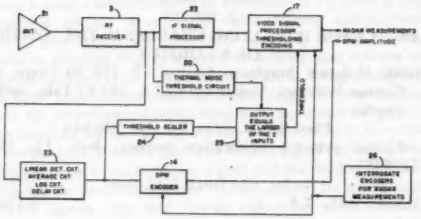
the frequency range of said means for intermittently frequency modulating the oscillator being such that the phase difference between the transmitted signal and the reflected signal at said receiver caused by said means somewhat exceeds 180°, and

means responsive to the output of said phase comparing circuit and the means for intermittently frequency modulating the oscillator to set the oscillator to such a frequency that during the periods between the intermittent frequency the phase difference between the transmitted and received signals is $n \cdot 180°$ where n is an integer, and the output of said phase comparing circuit during said periods is representative of the vibrations of the object.

3,973,260
DISPERSED PULSE MEASUREMENT FOR AGC AND DYNAMIC THRESHOLDING OF A CHIRPED RADAR RECEIVER

Ralph J. Costantini, Millburn, N.J.; Charles R. Parsons, Broomfield, Colo., and Stanley J. Schretter, Flanders, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 6, 1974, Ser. No. 503,827
Int. Cl.² G01S 7/30, 9/233
U.S. Cl. 343—17.2 PC **8 Claims**

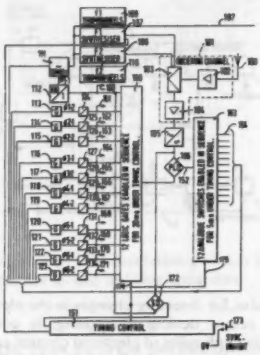


1. In a chirp radar system in which chirp pulse returns are received by a receiver and sent to processors for dechirping and measuring the radar return, the improvement comprising measurement means connected to receive the chirp pulse return before it is dechirped; delay means connected in said measurement means so as to delay an output of said measurement means by a time equal to the time a chirped return will be delayed through the radar processors; said output of the measuring means being connected to the radar processors for setting a threshold value therein; a thermal noise threshold circuit connected to an output of the receiver; comparator circuit means having first and second inputs connected to the outputs of the thermal noise threshold circuit and the measurement means whereby an output of the comparator circuit means will be equal to the largest of the values fed to its input; and said output of said comparator circuit means being connected to supply a threshold value to the radar processor circuits.

3,973,261
SYNCHRON TIMING OF SIGNALS IN SPACED TRANSMITTERS AND IN A RECEIVER FOR A PHASE COMPARISON NAVIGATION SYSTEM USING TIME SEQUENTIAL TRANSMISSIONS

Derek John Phipps, London, England, assignor to Decca Limited, London, England

Filed Nov. 15, 1974, Ser. No. 524,199
Claims priority, application United Kingdom, Nov. 16, 1973, 53229/73
Int. Cl.² G01S 1/30
U.S. Cl. 343—105 R **7 Claims**



1. Sychronizing means for a phase comparison radio navigation system having a prime and one or more secondary spaced transmitting stations radiating phase-locked signals in a time-shared sequence, the prime station also radiating a timing identification signal, and one or more receivers for comparing the phase of the signals; which synchronizing means comprise, at the prime station, a signal source of a frequency related to the radiated frequency, digital counting means for deriving timing signals by counting signals from said signal source and means controlling the timing of the prime station transmissions in response to the output of the counter and wherein, in a receiver, there are provided means for receiving the radiated signals, means for deriving, from the received signals of said radiated frequency, a repetitive pulse counter input signal of a frequency related thereto, and a counter arranged for counting pulses from said counter input signal to derive a timing cycle corresponding to that at the prime station, and wherein the transmissions from said prime station include a timing indentification signal and wherein, at the receiver, means are provided for detecting said timing identification signal and for applying the detected signal as a synchronizing signal to the counter to synchronize the counter timing at the receiver with the timing of the counting means at the prime station.

3,973,262
RADIO DIRECTION FINDER WITH MEANS FOR REDUCING SENSITIVITY TO MULTIPATH PROPOGATION ERRORS

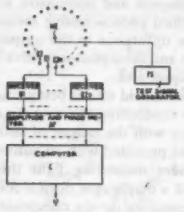
Manfred Böhm, Stuttgart, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 21, 1974, Ser. No. 525,843
Claims priority, application Germany, Nov. 24, 1973, 2358585
Int. Cl.² G01S 5/02
U.S. Cl. 343—113 R **6 Claims**

1. A radio direction finder comprising:

a plurality of antenna elements, each of said elements being located to receive incident waves at an amplitude which is the vector sum of desired signal and spurious signals of lesser amplitude, if any;

amplitude measuring means for determining the amplitude of the sum signal received at each of said elements;
phase measuring means for determining the phase difference of received signal between at least two selected element pairs;
and angle computing means responsive to said amplitude and phase measuring means for applying the law of co-



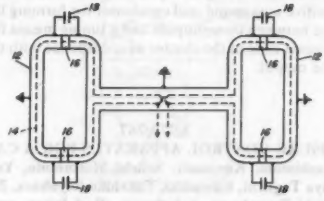
sines to determine the angle of arrival of the strongest signal, corresponding to said desired signal, the values determined by said amplitude measuring means corresponding to the sides of a triangle of receiving element sum signal vectors, said angle computing means being operative to determine the angle of said triangle corresponding to the angle of arrival of the signal represented by the largest of said vectors.

3,973,263

SENSITIVITY IMPROVEMENT OF SPACED-LOOP ANTENNA BY CAPACITIVE GAP LOADING

Terence C. Green, San Antonio, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 20, 1973, Ser. No. 353,143
Int. Cl.² H01Q 7/04
U.S. Cl. 343—744 **4 Claims**



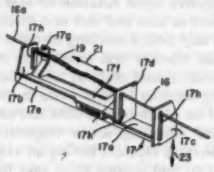
1. In a shielded, coaxial, spaced-loop antenna having a plurality of gaps in its shield, the improvement comprising:
a capacitance network individual to and across each gap, each said network having substantially the same value, whereby increased sensitivity is achieved at a predetermined frequency,
all networks having an equal number of corresponding capacitor elements, corresponding elements of different networks having substantially the same value; and
means associated with each network for selectively connecting each element individually and across each of said shield gaps.

3,973,264

STYLUS ASSEMBLY FOR FACSIMILE RECEIVER

Matthew J. Costello, Bethel; Donald T. Dolan, Ridgefield; Andre T. Debaudringhien, Stamford; Antoon M. Hurkmans, New Milford; Kenneth R. Jasinski, Danbury, and Edward G. Keplinger, Woodbury, all of Conn., assignors to Graphic Sciences, Inc., Danbury, Conn.

Division of Ser. No. 312,857, Dec. 7, 1972, Pat. No. 3,886,308.
This application Feb. 21, 1975, Ser. No. 551,623
Int. Cl.² G01D 15/16; H04N 1/00
U.S. Cl. 346—139 A **24 Claims**



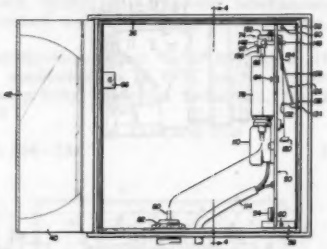
1. A stylus assembly comprising
a stylus support plate, and
a wire stylus mounted on said support plate by apparatus including a spring which urges said stylus in a direction parallel to said support plate toward a sheet of paper on which said stylus is to perform a writing operation, said spring also urging said wire stylus in a second direction away from said support plate to insure contact of said stylus with an electrical supply member adjacent to said support plate.

3,973,265

TEMPERATURE RECORDING INSTRUMENT

Richard A. Andrews, Dearborn, Mich., assignor to H. O. Trerice Co., Oak Park, Mich.

Filed May 1, 1975, Ser. No. 573,686
Int. Cl.² G01D 15/24
U.S. Cl. 346—139 R **18 Claims**



1. An instrument for recording temperatures or other information comprising a housing, a plate mounted in said housing, said plate having a pair of sides, one of the sides of said plate being adapted to carry a chart upon which information may be recorded, a non-rotatable mounting element carried by said plate and having an axis extending through said plate, said mounting element extending through the opposite sides of said plates to provide a pair of bearing surfaces, one bearing surface on each side of said plate, a rotatable bracket carried by the bearing surfaces of said mounting element, said bracket including a bridge portion extending across said plate adjacent but spaced from said axis, an arm portion at one end of said bridge portion at said one side of said plate, said arm portion having an opening for receiving one of the bearing surfaces of said mounting element, and a flange portion at the other end

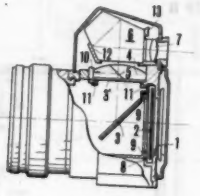
of said bridge portion at the other side of said plate, said flange portion including a first part having an opening for receiving the other of the bearing surfaces of said mounting element, said first part of said flange portion including a pair of slots, one slot being located on each side of said last mentioned opening and said axis of said mounting element, said flange portion having a seconnd part including a pari of ears at the ends of said first portion, said ears being generally parallel to said axis, a non-rotatable spool located in either one or the other of said slots, an adjusting screw carried by one of said ears which corresponds to the slot in which said spool is located, said adjusting screw being threadedly secured to said spool and effective upon rotation of said adjusting screw to move said spool in said one slot in a direction generally perpendicular to said axis, a marking element secured to the arm portion of said bracket and adapted to mark the chart, an actuator secured to said plate at said other side thereof, said actuator being secured to said plate in one of two positions which depend on which of said slots and said cars employ said spool and said adjusting screw respectively, said actuator including a movable element having an axis which is generally perpendicular to and spaced from said first mentioned axis, said movable element being located on the same side of said first mentioned axis as said spool and said adjusting screw, said actuator element including an abutment surface engageable with said spool located in one of said slots, said actuator upon energization thereof being effective to move said actuator element and to thereby rotate said bracket resulting in the movement of said marking element across said chart to record information thereon.

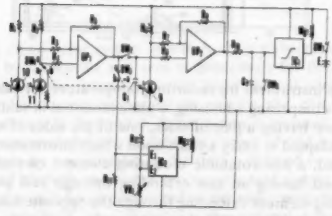
3,973,266

LIGHT MEASURING SYSTEM OF CAMERA

Masamichi Kakunodate, Tokyo, and Soichi Nakamoto, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 10, 1974, Ser. No. 468,983
Claims priority, application Japan, May 15, 1973, 48-53900
Int. Cl.[2] G03B *7/08*; G01J *1/46*
U.S. Cl. 354—31 **19 Claims**





1. A camera shutter control device comprising:

a light intensity-to-electric signal conversion means, said means including a first, second and third photosensitive means, respectively, said first and second photosensitive means for sensing the light flux coming from different parts of a scene object, said second and third photosensitive means for sensing the light flux coming from substantially one and the same part of a scene object, each of the first, second and third photosensitive means for providing electrical output signals corresponding to the quantity of light incident thereupon, respectively;

a memory means, said means being electrically coupled and responsive to said first and said second photosensitive means for memorizing the difference in signal outputs between the first and the second photosensitive means;

an operation means, said means being coupled at an input terminal thereof and responsive to said memory means and said third photosensitive means respectively for obtaining the difference in the outputs between said memory means and third photosensitive means as an operation means output; and

a control means, said means being coupled to said operation means for controlling the time for opening the shutter in accordance with the output of said operation means.

12. A camera provided with an automatic exposure control system, a system measuring light through a photographic taking lens and a diaphragm device comprising:

a. a light measuring device comprising a first and a second photosensitive means, said both means provided behind said lens for respectively receiving the light beam coming from different parts of an object to be photographed and for converting the light beam received into electrical output signals;

means being electrically coupled and responsive to said both photosensitive means, for providing the difference between their respective electrical output signals;

a shutter speed setting means, said setting means including a variable resistance, said resistance having a value corresponding to the set shutter speed;

means responsive to said difference-providing means and said shutter speed setting means for comparing the signals, out of said difference-providing means and shutter speed setting means with each other and for determining the opening of said diaphragm, said comparing and determining means also including an electromagnetic element and being engageable with said diaphragm device;

a memory condenser, said condenser being electrically coupled to said difference-providing means for storing its output;

a shutter control device, said device including a third photosensitive means, for receiving substantially the same light beam coming from the object to be photographed as said second photosensitive means, and also including an operation circuit having an input coupled to said third photosensitive means and said condenser for forming the difference between their outputs and a timing means for setting the open time of the shutter in accordance with the difference output.

3,973,267

EXPOSURE CONTROL APPARATUS FOR A CAMERA

Teiji Hashimoto, Kawasaki; Seiichi Matsumoto, Yokohama; Tetsuya Taguchi, Kawasaki; Takehiko Kiyohara, Zama, and Tokuichi Tsunekawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1974, Ser. No. 534,578
Claims priority, application Japan, Dec. 25, 1973, 49-1215
Int. Cl.[2] G03B *7/08*
U.S. Cl. 354—43 **5 Claims**

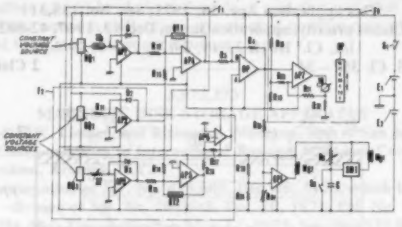
1. An exposure control apparatus for a camera comprising:

means for measuring brightness of an object to be photographed, having a first logarithmic compression means to generate an electrical output signal corresponding to object brightness which is logarithmically compressed;

means for setting photographing informations other than said object brightness, having a second logarithmic compression means to generate an electrical output signal corresponding to the set photographing informations which is logarithmically compressed;

a temperature compensation means, having a biasing signal generation means and also having a third logarithmic compression means to logarithmically compress the biasing signal;

an operation means which employs as its first input voltage a synthesized signal of the output signal of the said brightness measuring means and the output signal of said temperature compensation means and employs as its second input voltage a synthesized signal of the output signal of



said photographing information setting means and the output signal of said temperature compensation means;

a diaphragm aperture indication meter having a meter pointer being driven corresponding to the output of said operation means;

means interposed between said operation means and the meter to convert the output voltage signal of said operation means to a constant current signal; and

means to control the camera diaphragm by the output of said operation means.

3,973,268

CAMERA WITH AUTOMATIC FILM ADVANCE

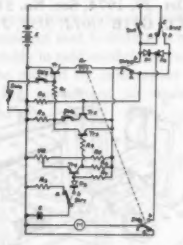
Akihiro Arai, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Dec. 4, 1974, Ser. No. 529,579

Claims priority, application Japan, Dec. 5, 1973, 48-135260

Int. Cl.² G03B *1/00, 17/42*

U.S. Cl. 354—173 **6 Claims**



1. In a camera capable of being operated either automatically to make a series of exposures or manually to make individual exposures at the option of the operator, film-advancing means for advancing film in the camera, electric motor means operatively connected with said film-advancing means for operating the latter, shutter means for exposing film, shutter-cocking means operatively connected between said shutter means and said motor means to be operated by the latter for cocking said shutter means in preparation for an exposure, shutter-release means operatively connected with said shutter means for releasing the latter, after it is cocked, to make an exposure, automatic shutter-tripping means operatively connected with said motor means to be driven thereby and cooperating with said shutter-release means for automatically tripping the latter to release said shutter means, manual shutter-tripping means operatively connected with said shutter-release means for manually tripping the latter to release said shutter means, and electrical circuit means operatively connected with said electric motor means for automatically energizing the latter upon completion of an exposure to drive said film-advancing means and shutter-cocking means for advancing the next unexposed film frame into a position for exposure and for cocking said shutter means in preparation for the next exposure, said circuit means including a manually operable switch means capable of being placed by the operator either in a continuous position or in a single-exposure position, said switch means when placed in said continuous position thereof controlling said circuit means for operating said electric motor means to actuate said automatic shutter-tripping means and when in said single exposure position thereof placing said circuit means in a condition requiring operation of said manual shutter-tripping means to trip the shutter-release means, said circuit means automatically actuating said electric motor means, upon displacement of said switch means from said continuous to said single-exposure position thereof, to stop operating only after actuating said film advancing means to advance the next unexposed film frame to an exposure position and said shutter-cocking means to cock the shutter means, so that immediately upon ending of operation in a continuous mode, said manual shutter-tripping means is available for tripping the shutter-release means and making an exposure, said electrical circuit means including a timing circuit means for controlling the interval from one exposure to the next when said manually operable switch means is in said continuous position thereof, and said manually operable switch means having two continuous positions in addition to said single-exposure position, said timing circuit means being effective in one of said continuous positions of said manually operable switch means, and said electrical circuit means including a bypass circuit means for bypassing said timing circuit means when said manually operable switch means is in the other of said continuous positions for making a series of exposures without said timing interval from one exposure to the next.

3,973,269

SHUTTER MECHANISM

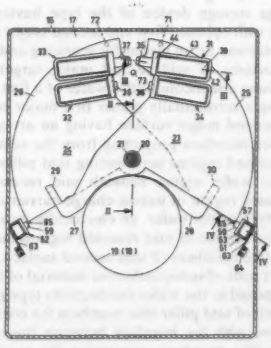
Carl Koch, Stetten, and Karl Gfeller, Schaffhausen, both of Switzerland, assignors to Sinar AG Schaffhausen, Switzerland

Continuation-in-part of Ser. No. 489,089, July 29, 1974. This application Feb. 26, 1975, Ser. No. 553,160

Claims priority, application Switzerland, Feb. 26, 1974, 2729/74

Int. Cl.² G03B *9/08*

U.S. Cl. 354—234 **21 Claims**



1. An electrically controlled shutter device for a photographic camera, the shutter device comprising:

at least one shutter element mounted for movement between two rest positions for opening and closing a light admitting aperture of the camera;

drive means operatively associated with said shutter element for causing the movement of said shutter element between its rest positions;

external trigger control means for initiating an opening and closing of said aperture for an exposure operation and supplying electrical signals indicative of such operation;

position monitoring means associated with said shutter element for providing a signal in dependence upon said shutter element being located at a predetermined position;

braking means operatively associated with said shutter element; and,

control means coupled to an output of said position monitoring means for controlling the operation of the shutter device as a function of signals provided by said position monitoring means and as a function of signals from said external trigger control means, and said control means being operatively coupled to said braking means for selectively controlling its operation as a function of a signal provided by said position monitoring means upon movement of said shutter element into a predetermined position.

3,973,270

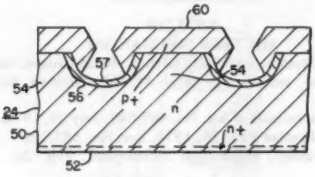
CHARGE STORAGE TARGET AND METHOD OF MANUFACTURE

Dieter K. Schroder, and Robert A. Wickstrom, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 519,160, Oct. 30, 1974, which is a continuation of Ser. No. 241,045, April 4, 1972, abandoned. This application Mar. 18, 1975, Ser. No. 559,466

Int. Cl.² H01L *31/00*

U.S. Cl. 357—31 **7 Claims**



7. A charge storage device of the type having a charge storage target with opposed first and second major target sides and reading electron beam means for scanning and selectively contacting portions of said second major target side, said target comprising a semiconductive wafer of a first conductivity type having a substantially planar first major surface, and an opposed second major surface having an array of spaced apart pillar-like members projecting from the semiconductor wafer and recessed regions surrounding said pillar-like members, with the wafer region beneath said recessed regions having a diffused region of excess charge carrier of the same conductivity type as the wafer, an electrically insulating layer provided in the surface of said recessed regions and the walls of said pillar-like members of said second surface, epitaxially grown contact pads of semiconductive material of the conductivity type opposed to the wafer conductivity type provided on the end of each of said pillar-like members for contact by said reading means, with the interface between the contact pad and the pillar-like members comprising the rectifying junction, which contact pad extends laterally beyond the pillar-like member side walls and spaced above a portion of the insulated layer covered recessed regions, and which contact pad extends downwardly along the pillar-like member insulated layer covered side walls.

3,973,271

SEMICONDUCTOR DEVICE HAVING BONDING PADS EXTENDING OVER ACTIVE REGIONS

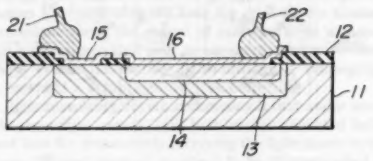
Tomisaburo Okumura, and Takatoshi Matsuo, both of Kyoto, Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Continuation of Ser. No. 782,353, Dec. 9, 1968, abandoned. This application Apr. 28, 1971, Ser. No. 138,311

Claims priority, application Japan, Dec. 13, 1967, 42-80214

Int. Cl.² H01L *23/48, 29/72, 29/46, 29/62*

U.S. Cl. 357—34 **2 Claims**



1. A planar type semiconductor device comprising a semiconductor body, base and emitter regions formed in one surface thereof, an insulator layer on said one surface, said insulator layer having apertures for electrode attachment to said base and emitter regions, and electrodes comprising a metallic film ohmically contacting said base and emitter regions through said apertures, said electrodes having narrow extensions and generally circular bonding pads extending over said insulating layer at the extremities of said extensions, said base and emitter regions and apertures having narrow extensions extending to beneath said bonding pads, wherein lead wires are bonded to said extensions of said base and emitter regions at said bonding pads.

3,973,272

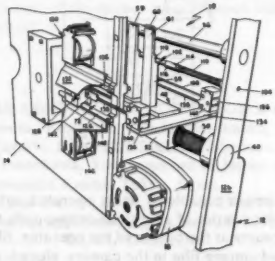
DISC RECEIVER INTERLOCK FOR DISC RECORDERS

Samuel A. Morgan; Samuel N. Irwin, and Otto R. Butsch, all of Ann Arbor, Mich., assignors to Sycor, Inc., Ann Arbor, Mich.

Filed Oct. 29, 1974, Ser. No. 518,501

Int. Cl.² G11B *5/012, 5/55, 21/10*

U.S. Cl. 360—86 **12 Claims**



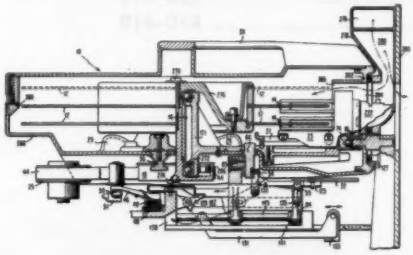
1. In a recorder/reproducer apparatus of the type using a magnetic disc as the recording media, having at least one transducing head for recording and reproducing operations on said disc, having receiver means for receiving and positioning said disc in transducing relationship to said head, said receiver means having at least a portion shiftable between a position providing access for placing or removing a disc therefrom and an operative position precluding such access, having means for shifting said receiver means portion between said access and operative positions, and drive means for moving said head

radially along the side of said disc for transducing operation therewith, including movement to and from at least one home position in which the head is located along the side of the disc at some point along the width of said disc between its center and its edge, the improvement comprising: interlocking means for disabling said receiver means portion from shifting to said access position when said head is away from said home position, including means for locking and unlocking said shifting means, and means for controlling the locking and unlocking of said shifting means in response to the particular relative position of said head along the side of said disc such that the shifting means is shiftable to an unlocked position only when said head is in said home position.

3,973,273
MAGNETIC DISK STORAGE APPARATUS

Rudolf W. Lissner, and Richard B. Mulvany, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 428,608, Dec. 26, 1973, which is a division of Ser. No. 206,688, Dec. 10, 1971, Pat. No. 3,786,454. This application May 12, 1975, Ser. No. 576,907
Int. Cl.² G11B *5/48, 21/08*
U.S. Cl. 360—98 **16 Claims**

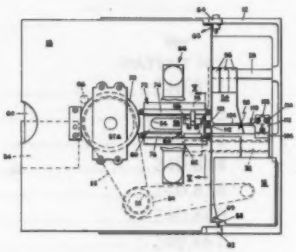


1. A data module drive unit comprising in combination:
a. means for receiving an interchangeable data module;
b. a motor including a bobbin element disposed in a flux gap of said motor to move towards and away from a received module;
c. connector means attached to said bobbin and selectively operable to connect said bobbin to a movable transducer carriage assembly in said module to cause said transducer carriage to be moved by said motor and to cause said carriage during movement to maintain said bobbin aligned in said gap.

3,973,274
METHOD AND APPARATUS FOR MOUNTING AND POSITIONING MAGNETIC RECORDING HEADS

Samuel A. Morgan, Ann Arbor, Mich., assignor to Sycor, Inc., Ann Arbor, Mich.

Filed Sept. 30, 1974, Ser. No. 510,471
Int. Cl.² G11B *5/54, 5/60, 21/10*
U.S. Cl. 360—104 **32 Claims**



1. In a data recorder/reproducer device for use with disc-type recording media and having a disc-mounting means for supporting such a recording disc in predetermined position, further having a transducing head for proximately engaging and transducing signals recorded on such a disc, a rotary drive means for rotating such a disc, and translational drive means coupled to said transducing head to move the same laterally along a disc so positioned, the improvement comprising: referencing means laterally adjacent the positioned disc for establishng a predetermined transducing proximity relationship between said head and such a disc; said referencing means including reference guide mans disposed generally along at least one side of such a disc, generally parallel to and spaced laterally rom a radius threof; carrier means supporting such head for guided and positioned movement along said guide means; and flexible linking means connected between said carrier means and said transitional drive means, said linking means being sufficiently rigid in tension and compression to pull or push said carrier and thus said head, to move the head along the side of such disc in response to movements of said translational drive means with substantial bending or bowing of the linking means, and said linking means also being sufficiently flexible to elastically flex and to thereby permit said head to be moved laterally relative to the disc and the normal transducing position of the head as established by said guide means, without permanent deformation of said linking means.

DESIGN PATENTS

GRANTED AUGUST 3, 1976

ERRATA

For CLASS	See PATENT NO.
034–045	240,811
025–048	240,812
025–072	240,813
025–075	240,814
025–062	240,854
016–059	240,860
016–057	240,861
016–006	240,862
016–028	240,863
016–014	240,864

DESIGN PATENTS

GRANTED AUGUST 2, 1955

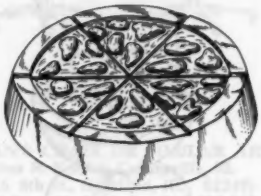
ERRATA

Pat. No.	Name
D184,045	[illegible]
D184,046	[illegible]
D184,047	[illegible]
D184,048	[illegible]
D184,049	[illegible]
D184,050	[illegible]
D184,051	[illegible]
D184,052	[illegible]
D184,053	[illegible]
D184,054	[illegible]
D184,055	[illegible]

DESIGNS

AUGUST 3, 1976

240,770
ANIMAL BISCUIT OR THE LIKE
Harold S. French, 60 E. 8th St.,
New York, N.Y. 10003
Filed Mar. 10, 1975, Ser. No. 556,647
Term of patent 7 years
Int. Cl. D1—*01*
U.S. Cl. D1—27

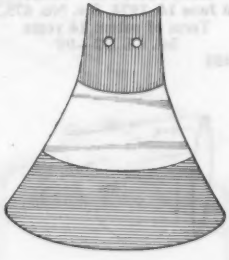


240,771
BRASSIERE OR SIMILAR ARTICLE
Seymour Lipton, 39 Woodhale St.,
Lido Beach, N.Y. 11561
Filed Nov. 29, 1974, Ser. No. 528,423
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—24

240,772
JACKET OR SIMILAR ARTICLE
Jerome Williams, 385 Linoleum Way,
Pittsburgh, Pa. 15219
Filed Oct. 21, 1974, Ser. No. 516,443
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—187

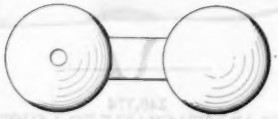
240,773
SHOE
Tatsuo Fukuoka, 3, 3-Ban, 2-chome, Shin-Minami-
Fukushima, Tokushima, Japan
Filed Dec. 6, 1974, Ser. No. 530,296
Claims priority, application Japan Nov. 8, 1974
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—268

240,774
SHOE FLAP ATTACHABLE TO A SHOE LACE
Rosalie Ortner, 48 Elmwood Terrace,
Linden, N.J. 07036
Filed June 17, 1974, Ser. No. 479,626
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—314



240,775
REMOVABLE INSOLE CUSHION
John L. Voorhees, 13053 N. 33 Place, Phoenix, Ariz. 85029
Filed June 13, 1974, Ser. No. 479,114
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—318

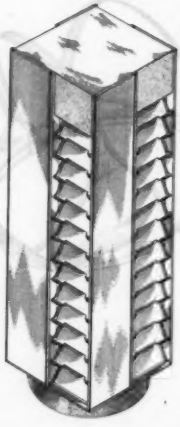
240,776
GARMENT MARKING TAG
Reginald B. Pollard, 2840 Sylvester Road 31705, and De Lacey Allen, Jr., 1152 Dawson Road 31707, both of Albany, Ga.
Filed May 21, 1974, Ser. No. 471,855
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—416



240,777
SHIRT SLEEVE
Pete Petersen. P.O. Box 6231, Hollywood, Fla. 33021
Filed June 14, 1974, Ser. No. 479,350
Term of patent 14 years
Int. Cl. D2—*99*
U.S. Cl. D2—452

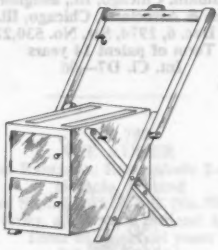
240,778
DISPLAY STAND
Joseph E. Mason, 10 Tuxedo Drive, Melville, N.Y. 11746
Filed Nov. 18, 1974, Ser. No. 524,461
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—20

240,779
DISPLAY STAND
Thomas H. Geismar, and Louis Scrima, New York, N.Y., assignors to Philip Morris Incorporated, New York, N.Y.
Filed July 14, 1975, Ser. No. 595,439
Term of patent 14 years
Int. Cl. D6—*04*; D20—*02*
U.S. Cl. D6—25

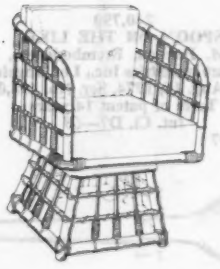


240,780
CHAIR OR SIMILAR ARTICLE
Karl Dittert, Schwabisch Gmund, Germany, assignor to Giroflex-Entwicklungs AG, Koblenz, Switzerland
Filed June 18, 1973, Ser. No. 371,298
Claims priority, application Switzerland Feb. 23, 1973
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—30

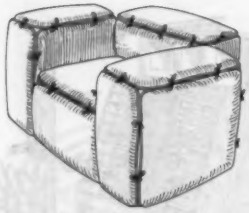
240,781
FISHERMAN'S CHAIR OR SIMILAR ARTICLE
Erna R. Kohler, Collinsville, Ill.
(1316 8th St., Highland, Ill. 62249)
Filed Nov. 11, 1974, Ser. No. 522,508
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47



240,782
SWIVEL ARM CHAIR
Henry Olko, Applegreen Drive, Old Westbury, N.Y. 11568
Filed Aug. 23, 1974, Ser. No. 499,989
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—57

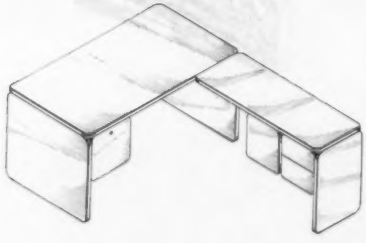


240,783
CHAIR
Otto Zapf, Eschborn, Germany, assignor to Knoll International, Inc.
Filed July 5, 1973, Ser. No. 376,746
Claims priority, application Germany Feb. 28, 1973
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71



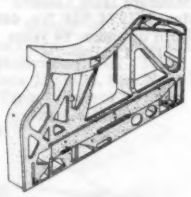
240,784
SOAP DISH OR THE LIKE
Roger P. Beauchamp, Harrisville, R.I., assignor to Dart Industries, Inc., Los Angeles, Calif.
Filed July 11, 1975, Ser. No. 595,198
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—89

240,785
DESK
Fuller Robinson, Jalisco, Mex., assignor to Standard Desk Limited
Filed Mar. 6, 1974, Ser. No. 448,506
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—162

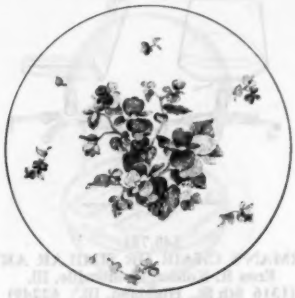


240,786
DISPLAY UNIT FOR FABRIC AND SEWING NOTIONS
James B. Adams, Jr., 1806 Beechtree Road, Greensboro, N.C. 27408
Filed May 15, 1975, Ser. No. 577,738
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—188

240,787
FURNITURE SUBFRAME
Charles P. Bohan, Wilmington, William R. Curtis, New Castle, and David C. Trimble, Yorklyn, Del., assignors to Hercules Incorporated, Wilmington, Del.
Filed Nov. 11, 1974, Ser. No. 522,970
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—195

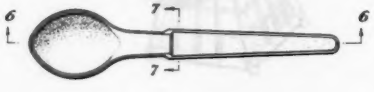


240,788
PLATE OR SIMILAR ARTICLE
Seiichi Makita, Nagoya, Japan, assignor to Noritake Co., Limited (Nippon Toki Kabushiki Kaisha), Nagoya, Japan
Filed Apr. 25, 1975, Ser. No. 572,474
Claims priority, application Japan Nov. 6, 1974
Term of patent 7 years
Int. Cl. D7—*01*
U.S. Cl. D7—35



240,789
DRINKING STRAW
Mitchell J. Frumkin, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed Dec. 6, 1974, Ser. No. 530,227
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—42

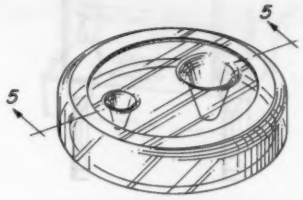
240,790
SPOON OR THE LIKE
Robert H. C. M. Daenen, Erembodegem, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Aug. 16, 1974, Ser. No. 498,004
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137



240,791
VACCUM CLEANER HOSE HANDLE
Thaddeus E. Bednarski, Ridgefield, Conn., Robert J. Brown, South Salem, N.Y., and John J. Moughty, Old Greenwich, and George Schick, Trumbull, Conn., and John J. Kowalewski, deceased, late of Riverside, Conn., by Stephanie H. Kowalewski, executrix, Riverside, Conn., assignors to Consolidated Foods Corporation, Old Greenwich, Conn.
Filed Apr. 9, 1975, Ser. No. 566,376
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D7—172

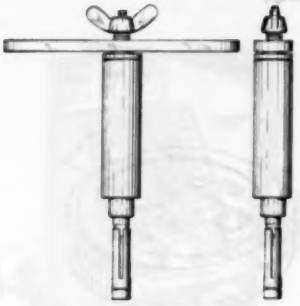
240,792
ICE AUGER
Uuno Rantanen, Rauhankatu 2–4 A 5, Heinola, Finland
Filed Sept. 11, 1974, Ser. No. 504,883
Claims priority, application Finland Apr. 26, 1974
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—8

240,793
COMBINED CAN PUNCH OPENER AND CLOSURE
Roger R. Shumway, Glendale, Ariz., and Donald C. Bortel, 6301 W. Oregon, Glendale, Ariz. 85301; said Shumway assignor to said Bortel
Filed Oct. 21, 1974, Ser. No. 516,391
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—34

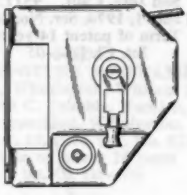


240,794
TROWELLING TOOL
Dan J. Marx, 3572 Columbine Drive, San Jose, Calif. 95127
Filed July 1, 1974, Ser. No. 484,607
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—45

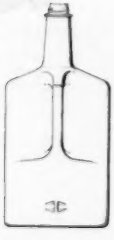
240,795
PLUMBER'S VALVE PULLING TOOL
Ezekiel Seminario, 15500 Tustin Village Way, Tustin, Calif. 92680
Filed Apr. 12, 1974, Ser. No. 460,568
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—59



240,796
BICYCLE LOCK
Andrew Y. Bleier, Chicago, Philip J. Burnstein, Skokie, and John J. Aiken, Bolingbrook, Ill., assignors to Bik-Lok, Inc., Chicago, Ill.
Filed Apr. 25, 1975, Ser. No. 571,801
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—113



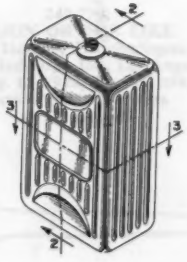
240,797
JUG
Russell E. Poteet, New York, N.Y., assignor to Schenley Industries, Inc., New York, N.Y.
Filed June 3, 1974, Ser. No. 475,886
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—39



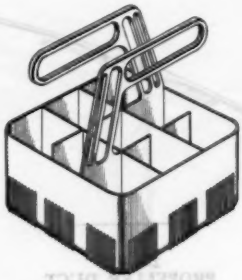
240,798
PACKAGING CONTAINER
Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Oct. 21, 1974, Ser. No. 516,482
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—147

240,799
DISPENSING CONTAINER
Richard C. Lewis, Chicago, Ill. (464 Green Bay Road, Winnetka, Ill. 60093)
Filed Aug. 31, 1973, Ser. No. 393,314
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—164

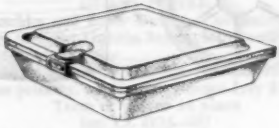
240,800
BOTTLE
Paul W. Jespersen, Stamford, Conn., assignor to Georgia-Pacific Corporation, Portland, Oreg.
Filed July 5, 1974, Ser. No. 486,079
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—167



240,801
BOTTLE CARRYING CASE
Rodney D. Marchetti, 1739 Oakdale Drive, Waukesha, Wis. 53186
Original design application Jan. 10, 1972, Ser. No. 216,903, now Patent No. 235,512. Divided and this application Nov. 25, 1974, Ser. No. 526,695
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—179

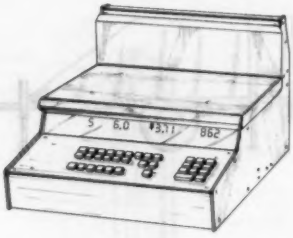


240,802
PACKAGING CONTAINER
Wayne L. Congleton, Whittier, Calif., assignor to Dolco Packaging Corporation
Filed Mar. 18, 1974, Ser. No. 452,096
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—182

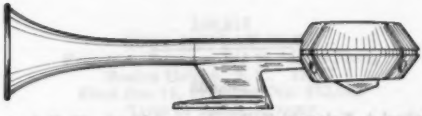


240,803
STACKING ELEMENT FOR CONTAINERS OR THE LIKE
Stanley Bell, Sands Point, N.Y., assignor to Attwood Products, Farmingdale, N.Y.
Filed Oct. 31, 1974, Ser. No. 519,618
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—294

240,804
POSTAL SCALE
Frank C. Rock, Santa Rosa, and Fred Lahira Moore, Petaluma, Calif., assignors to National Controls, Inc.
Filed Sept. 30, 1974, Ser. No. 510,452
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—91

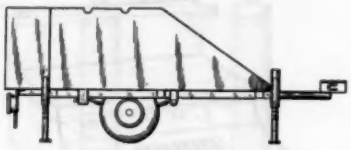


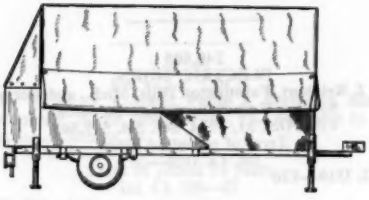
240,805
ELECTRIC HORN
Jay J. Reinhart, Farmington Hills, Mich., assignor to Sparton Corporation, Jackson, Mich.
Filed Oct. 31, 1974, Ser. No. 519,509
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—120



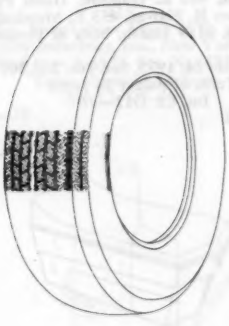
240,806
CYCLE TRAILER BODY OR THE LIKE
Edward L. Hawes, 405 E. Goulson, Hazel Park, Mich. 48030, and Allen R. Hawes, 453 E. Marshall, and Edward C. Hawes, 2129 Leitch, both of Ferndale, Mich. 48220
Filed Feb. 26, 1973, Ser. No. 335,509
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—102

240,807
MOTORCYCLE TRAILER
William Floodeen, 1023 3rd Ave. NE., Aberdeen, S. Dak. 57401
Filed July 24, 1974, Ser. No. 491,529
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—104



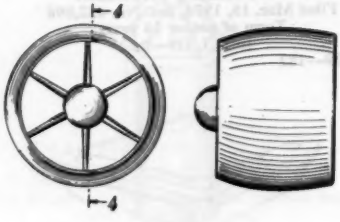


240,808
TIRE
Michael A. Kolowski, Tallmadge, and Charles W. Roberts, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company
Filed Oct. 16, 1974, Ser. No. 515,388
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142



240,809
VEHICLE WINDSHIELD WIPER BLADE ASSEMBLY
Raymond A. Deibel, West Falls, N.Y., assignor to Trico Products Corporation, Buffalo, N.N.Y.
Filed Apr. 7, 1975, Ser. No. 565,688
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155

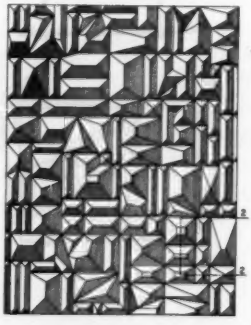
240,810
PROPELLER DUCT
Leonard Meyerhoff and Stanley A. Meyerhoff, both of Church St. Station, Box 222, New York, N.Y. 10008
Filed May 28, 1974, Ser. No. 474,097
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D12—214



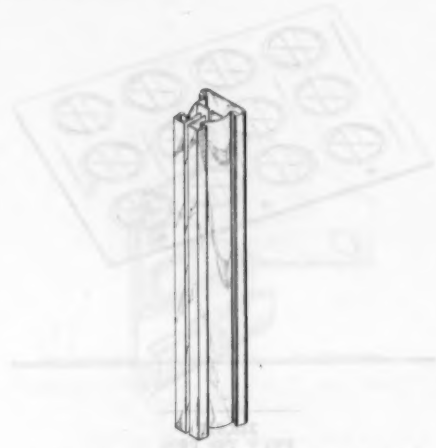
240,811
SWIMMING RACE STARTING BLOCK
Thomas E. Beall, Jr., 5350 Edgemoor Lane, Bethesda, Md. 20014
Filed July 3, 1974, Ser. No. 485,611
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D34—45

240,812
PET DOOR
Arthur G. Imbrecht, 2417 Novia, Newport Beach, Calif. 92660
Filed Aug. 6, 1973, Ser. No. 386,205
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—48

240,813
GLASS PANEL
Walter Paschke and Peter Dewitt, Viernheim, Germany, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, Hauts-de-Seine, France
Filed Jan. 14, 1974, Ser. No. 432,899
Claims priority, application France July 20, 1973
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—72

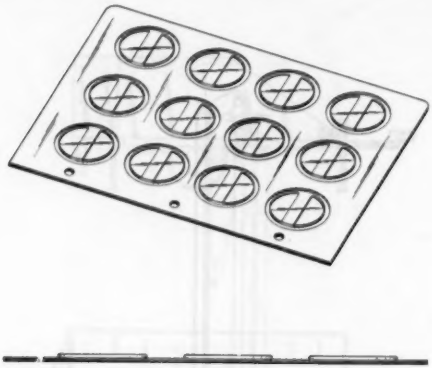


240,814
RIGID FRAME EXTRUSION
Theophile L. De Zinno, 1337 SW. 14th St., Miami, Fla. 33145
Filed Jan. 28, 1975, Ser. No. 544,931
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—75



240,815
COIN DISPLAY PAGE
Everett A. Peterson, 113 St. Marks Place, Roslyn Heights, N.Y. 11577
Filed Jan. 11, 1974, Ser. No. 432,698
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—33

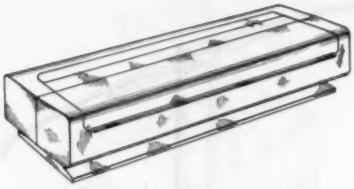
240,816
COIN DISPLAY PAGE
Everett A. Peterson, 113 St. Marks Place, Roslyn Heights, N.Y. 11577
Filed Jan. 11, 1974, Ser. No. 432,699
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—33



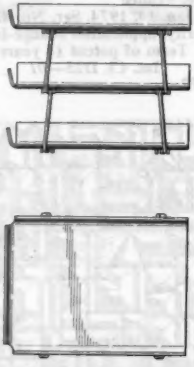
240,817
FELT TIP PEN
Takaji Funahashi, 1, 2-chome, Kitatakasho-machi, Nishi-ku, Nagoya-shi, Aichi-ken, Japan
Filed Jan. 28, 1975, Ser. No. 544,783
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—48

240,818
BELT ELEVATOR TYPE EDUCATIONAL TOY
Emmet Crawford, 2602 Central Ave., Box 474, Kearney, Nebr. 68847
Filed Dec. 9, 1974, Ser. No. 531,193
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—59

240,819
DESK CADDY
William Macowski, Caldwell, N.J., assignor to Katcham & McDougall, Inc., Roseland, N.J.
Filed Mar. 6, 1975, Ser. No. 555,981
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—75

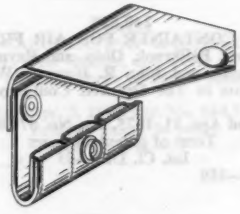


240,820
MULTIPLE TIER LETTER TRAY
Valentin E. Beil, Eden, and Francis J. Ihlenfeld, West Seneca, N.Y., assignors to McDonald Products Corporation, Buffalo, N.Y.
Filed Sept. 30, 1974, Ser. No. 510,563
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—92

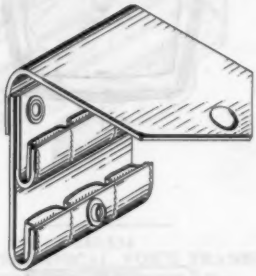


240,821
FISHING ROD HOLDER
Gary K. Pettee, 277 Martha, Elk Grove Village, Ill. 60007
Filed Oct. 9, 1975, Ser. No. 621,014
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—13

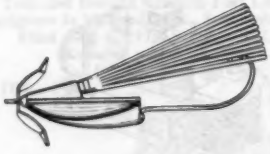
240,822
CARTRIDGE CASE
Thomas G. Burke, 6231 182nd St. SW., Lynnwood, Wash. 98036
Filed Nov. 27, 1974, Ser. No. 527,564
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—14



240,823
BELT TYPE BULLET HOLDER
Thomas G. Burke, 6231 182nd St. SW., Lynnwood, Wash. 98036
Filed Nov. 27, 1974, Ser. No. 527,565
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—14

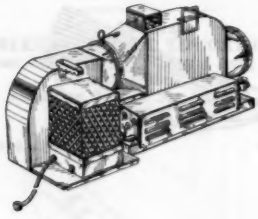


240,824
ARTIFICIAL FISH LURE
Jack E. Davis, Georgetown, Fla., assignor to Victor Comptometer Corporation, Chicago, Ill.
Filed Aug. 1, 1975, Ser. No. 601,062
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

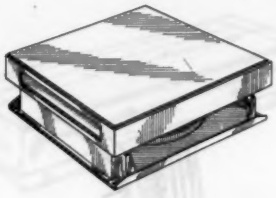


240,825
WASH BASIN
George S. Gruber, Hidden Hills, Calif., assignor to Designed Marble, Inc., Pacoima, Calif.
Filed June 13, 1975, Ser. No. 586,537
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58

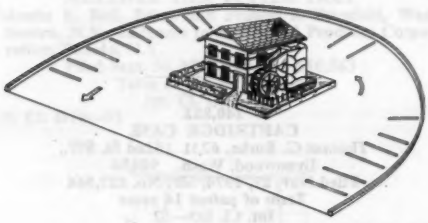
240,826
HEATER AND BLOWER ASSEMBLY
Allan E. Beavers, Littleton, and Thurman A. Pelsue, Denver, Colo., assignors to T. A. Pelsue Company, Englewood, Colo.
Filed Oct. 31, 1974, Ser. No. 519,675
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—73



240,827
COOLING UNIT FOR ELECTRONIC ENCLOSURES
Francis U. Hill, 1801 Lyndon Road, San Diego, Calif. 92013, and Albert James Carpenter, 3185 Blenkarne Drive, Carlsbad, Calif. 92008
Filed Sept. 13, 1974, Ser. No. 505,722
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—141

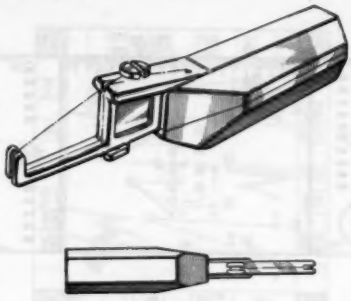


240,828
HUMIDIFIER
Frank A. Manfredi, 2026 W. 95th St., Cleveland, Ohio 44102
Filed Oct. 30, 1974, Ser. No. 519,190
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—146

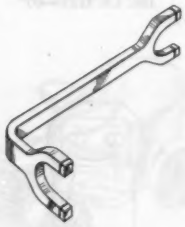


240,829
AEROSOL CONTAINER FOR AIR FRESHENER
David A. Jones, Bellbrook, Ohio, and Raymond E. Benson, Riverside, and John R. Howard, West Chicago, Ill., assignors to The Drackett Company, Cincinnati, Ohio
Filed Apr. 21, 1975, Ser. No. 570,045
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—150

240,830
DENTAL FLOSSING DEVICE
C. Raoul Murphy, 444 Saratoga Ave., Apt. 25B, Santa Clara, Calif. 95050
Filed June 16, 1975, Ser. No. 587,257
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—1 D

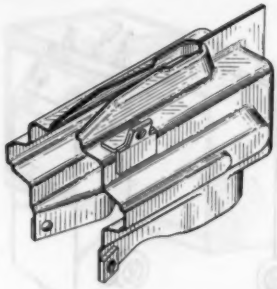


240,831
DENTAL FLOSS APPLICATOR
Hsio Wang, 2850 Citadel Drive NE., Warren, Ohio 44483
Filed Oct. 28, 1975, Ser. No. 626,335
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—1 D

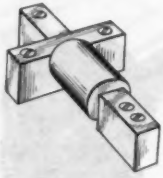


240,832
CALCULATING MACHINE
Myron Beitler, West Orange, and Terry L. Barner, Morris Plains, N.J., assignors to Litton Business Systems, Inc.
Filed Apr. 3, 1975, Ser. No. 564,743
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

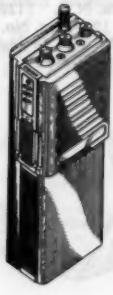
240,833
LIVE LINE CROSSARM END GUARD
Melvin E. Clutter, Centralia, and Edward L. West, Sturgeon, Mo., assignors to A. B. Chance Company, Centralia, Mo.
Filed Nov. 7, 1974, Ser. No. 521,794
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—10



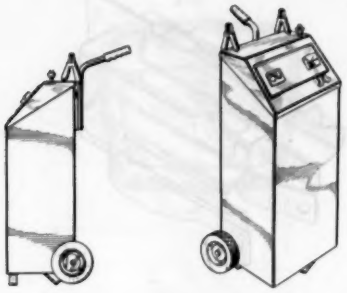
240,834
ELECTRO-MECHANICAL VOICE TRANSDUCER
Jerry O'Brien, 33 Pamrapo Ave., Jersey City, N.J. 07305
Filed Mar. 25, 1974, Ser. No. 454,221
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 L



240,835
PORTABLE TWO-WAY RADIO APPARATUS OR SIMILAR ARTICLE
Richard Toth and Donald Krumin, Fort Lauderdale, Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 6, 1975, Ser. No. 602,334
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 K



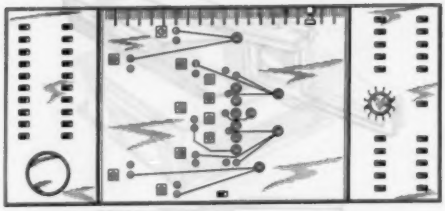
240,836
PORTABLE BATTERY BOOSTER
William B. Corvette, Conyers, Ga., assignor of fractional part interest to Leonard B. Steele, Fort Lauderdale, Fla.
Filed Nov. 13, 1974, Ser. No. 523,536
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D26—15 B



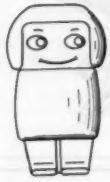
240,837
WALL PLAQUE OR SIMILAR ARTICLE
Doris Sweeney, 512A Taylor Ave., Warrington, Pa. 18976, and Mary Ellen Lee, 7951 Anita Drive, Philadelphia, Pa. 19111
Filed Feb. 7, 1975, Ser. No. 548,025
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23 B

240,838
PET LITTER RETRIEVER
Jon E. Nitu, 155 Logan St., Brooklyn, N.Y. 11208
Filed Nov. 14, 1974, Ser. No. 523,723
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—99

240,839
FOOTBALL GAMEBOARD
Craig J. Wilcockson, 385 Mason Ave., Staten Island, N.Y. 10305
Filed Dec. 9, 1974, Ser. No. 530,725
Int. Cl. D21—*01*
U.S. Cl. D34—5 FG



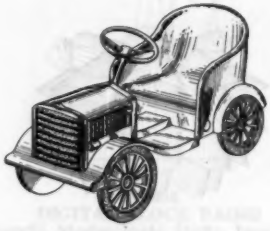
240,840
TOY FIGURE
Adolph E Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91345, and Erwin Benkoe, 17965 Medley Drive, Encino, Calif. 91316, and Dennis H. Merino, El Dorado Hills, Calif.; said Merino assignor to said Goldfarb and Benkoe
Filed Feb. 10, 1975, Ser. No. 548,690
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R



240,841
GOLF CLUB
Karsten Solheim, 501 Wakonda Lane, Phoenix, Ariz. 85023
Filed Jan. 31, 1974, Ser. No. 438,299
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GC

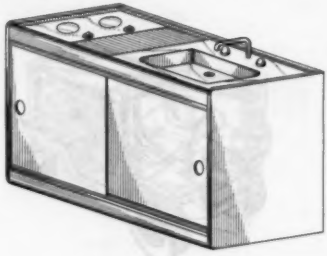
240,842
ANCESTRAL EDUCATIONAL GAMEBOARD
Ernest A. Montemayor, Arlington, Va. (4600 45th St. NW., Washington, D.C. 20016)
Filed Nov. 8, 1974, Ser. No. 522,062
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS

240,843
AUTO-SHAPED DEEP SEAT FOR PLAYGROUND APPARATUS
Ronald W. Zick, Minneapolis, Minn., assignor to The Toro Company, Minneapolis, Minn.
Filed Mar. 24, 1975, Ser. No. 561,316
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 L



240,844
MUSICAL TOY
Michael I. Satten, 245—20 Grand Central Parkway, Bellrose, N.Y. 11362
Filed Jan. 23, 1975, Ser. No. 543,405
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 C

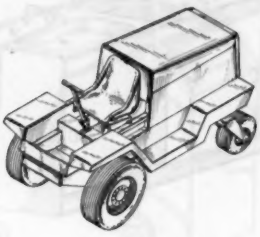
240,845
TOY KITCHEN
Per O. Hoel, Plainsboro, Erkki Pekka Korpijankko, Princeton, and Matthew A. Moustakas, Mercerville, N.J., assignors to CBS Inc.
Filed Apr. 16, 1975, Ser. No. 561,224
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AC



240,846
PLOW SHARE
Torsten August Andersson, Overum, Sweden, assignor to Aktiebolaget Overums Bruk
Filed May 22, 1974, Ser. No. 472,104
Claims priority, application Sweden Nov. 28, 1973
Term of patent 14 years
Int. Cl. D15—*03, 04*
U.S. Cl. D35—2 A

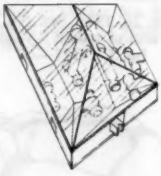
240,847
PLANTER FOR TOMATO PLANT
Richard Anthony, Jr., P.O. Box 2747, Anaheim, Calif. 92804, and Donald Lewis Anthony, Orange, Calif.; said Donald Lewis Anthony assignor to said Richard Anthony, Jr.
Filed Feb. 26, 1975, Ser. No. 553,227
Term of patent 7 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 B

240,848
UTILITY VEHICLE
J. Craig Henderson, Thomas George Teller, and T. Herbert Morrell, Owatonna, Minn., assignors to Owatonna Manufacturing Company, Inc., Owatonna, Minn.
Filed May 12, 1975, Ser. No. 576,475
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D40—5



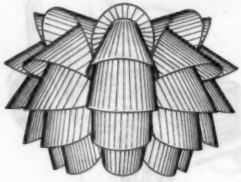
240,849
CATCH FOR WATCH BRACELETS AND THE LIKE
Howard J. Randall, Seekonk, Mass., assignor to Brite Industries Inc.
Filed Feb. 18, 1975, Ser. No. 550,191
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4 A

240,850
PENDANT HAVING A TRANSPARENT PRISM FACE
Carl J. Kleiner, 2302 Beach, Cisco, Tex. 76437
Filed July 11, 1974, Ser. No. 487,453
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—17

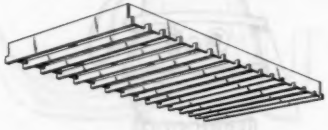


240,851
BOUDOIR LAMP
Barbara N. Jahandideh, 2324 Kraft Place, New Orleans, La. 70114
Filed Dec. 26, 1973, Ser. No. 427,602
Term of patent 7 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R

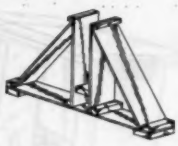
240,852
LAMP
Preben Jacobsen, Espergaerde, Denmark, assignor to A/S
Filed Nov. 20, 1973, Ser. No. 417,565
Claims priority, application Denmark June 26, 1973
Term of patent 7 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R



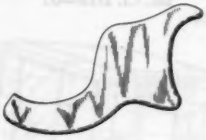
240,853
DECORATIVE ENCLOSURE FOR A LIGHTING FIXTURE
Bernard Aronson, Cherry Hill, N.J., assignor to Sim-Kar Lighting Fixture Co., Fort Washington, Pa.
Filed Jan. 16, 1975, Ser. No. 541,580
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R



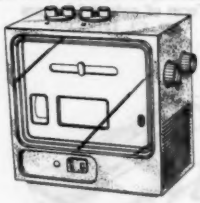
240,854
ADJUSTABLE SUPPORT FOR DOORS
James A. Crabtree, 391 SW. Forest Drive, Issaquah, Wash. 98027
Filed Dec. 9, 1974, Ser. No. 530,918
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—62



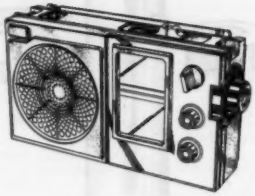
240,855
PICKGUARD FOR GUITAR OR SIMILAR ARTICLE
Richard L. Schneider, Kalamazoo, Mich., assignor to Norlin Music, Inc., Lincolnwood, Ill.
Filed Feb. 27, 1975, Ser. No. 553,515
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A



240,856
DIGITAL CLOCK RADIO
Shuhei Taguchi, Moriguchi-shi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan
Filed Dec. 18, 1974, Ser. No. 534,117
Claims priority, application Japan July 3, 1974
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D56—4 B



240,857
RADIO RECEIVER
Shinzo Murakami and Tsutomu Murakami, Neyagawa-shi, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan
Filed Nov. 7, 1974, Ser. No. 521,828
Claims priority, application Japan June 7, 1974
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

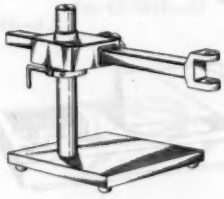


240,858
DIGITAL CLOCK RADIO
Shuhei Taguchi, Moriguchi-shi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan
Filed Dec. 18, 1974, Ser. No. 534,118
Claims priority, application Japan July 3, 1974
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D56—4 B

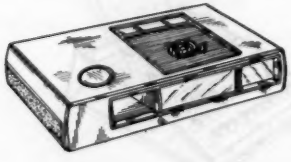
240,859
COMBINED RADIO AND CARTRIDGE RECORDER
Leonard Kaye, Westfield, N.J., assignor to Capehart Corporation, New York, N.Y.
Filed Jan. 30, 1975, Ser. No. 545,435
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D56—4 B

240,860
BINOCULAR ADJUSTMENT KNOB
Claus O. Huckenbeck, Sherman Oaks, Calif., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Apr. 30, 1975, Ser. No. 573,573
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—59

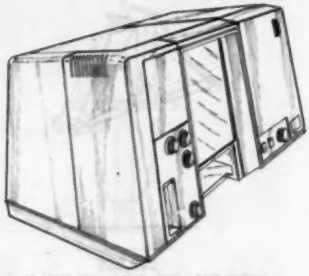
240,861
MICROSCOPE STAND
John T. Armbruster, Niagara Falls, N.Y., assignor to American Optical Corporation, Southbridge, Mass.
Filed Feb. 10, 1976, Ser. No. 657,009
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—57



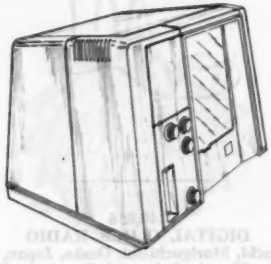
240,862
PHOTOGRAPHIC CAMERA
Michael Boehm, Green Farms, Conn., and Ronald Emmerling, New City, N.Y., assignors to J. C. Penney Co., Inc., New York, N.Y.
Filed June 26, 1974, Ser No. 483,392
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—6



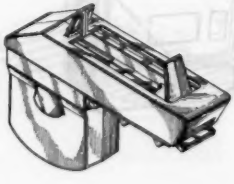
240,863
MICROFILM READER-PRINTER
Richard J. Olson, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Continuation-in-part of design application Ser. No. 379,148, July 13, 1973. This application Feb. 3, 1975, Ser. No. 546,565
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—28



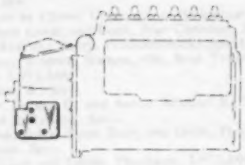
240,864
MICROFILM READER
Richard J. Olson, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Continuation-in-part of design application Ser. No. 379,150, July 13, 1973. This application Feb. 3, 1975, Ser. No. 546,861
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—14



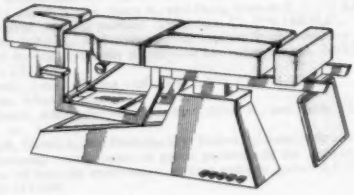
240,865
LABEL GUN
Clifton Eugene McDermott, Salt Lake City, Utah, assignor to Bio-Logics Products, Inc., Salt Lake City, Utah
Filed Feb. 12, 1975, Ser. No. 549,162
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D64—10



240,866
GOVERNOR CONTROL TAMPER-PROOF COVER FOR A VEHICLE ENGINE FUEL PUMP
Ted E. Raby, Lubbock County, Tex., assignor to F.I.E.
Filed Oct. 29, 1974, Ser. No. 518,479
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D77—1 A



240,867
CHIROPRACTIC TREATMENT TABLE
Barry M. Blumberg, Chatsworth, Calif., assignor to BAC Industries, Inc., Chatsworth, Calif.
Filed Oct. 18, 1974, Ser. No. 516,011
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 D



240,868
COMBINED COMB AND HAIR SPRAY CANNISTER
Allan E. Legere, Swampscott, Mass., assignor to Cesari and McKenna, Boston, Mass.
Filed Oct. 17, 1973, Ser. No. 407,295
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 A

240,869
ARTICLE STORAGE UNIT FOR AUTOMOTIVE VEHICLES
Charles R. Marr, 1855 E. Riverside Drive, Space 112, Ontario, Calif. 91761
Filed May 31, 1974, Ser. No. 474,933
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D87—1 R

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF AUGUST, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See—*
Keur, Robert I., 3,972,474.
Zahradnik, George J.; Pudark, Arthur A.; and Turner, Carl L., 3,972,461.

A. B. Dick/Scott: *See—*
Gross, Frank C., 3,972,610.

A. C. Nielsen Company: *See—*
Haselwood, Donald E.; Solar, Carl M.; and Thumm, Jeffrey R., 3,973,206.

A.E.C. Societe de Chimie Organique et Biologique: *See—*
Molle, Jean Louis; and Boch, Jean Christian, 3,973,031.

A/S Lovens Kemiske Fabrik Produktionsakieselskab: *See—*
Feit, Peter Werner; Nielsen, Ole Bent Tvaermose; and Bruun, Herta, 3,972,886.

Aaron, Michael B.: *See—*
Kesinger, Donald E.; and Aaron, Michael B., 3,972,460.

AB Akerlund & Rausing: *See—*
Kiellarson, Folke; Roos, Sven; and Quist, Thomas, 3,972,153.

AB Asea-Atom: *See—*
Olsson, Curt; and Sahlin, Thorbjorn, 3,972,099.

Abe, Norio: *See—*
Kodama, Yutaka; Kodama, Tsutomu; Takai, Akira; Senoura, Masaakira; Watanabe, Isao; Tanaka, Katsunori; Yamaguchi, Tomonobu; Abe, Norio; and Kodama, Takuya, 3,972,882.

Abiru, Hilomithu: *See—*
Kobayashi, Hidetoshi; Niitani, Yoshiaki; and Abiru, Hilomithu, 3,972,993.

ACF Industries, Incorporated: *See—*
Porter, David L., 3,972,656.

Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED: *See—*
Mercatoris, Robert, 3,972,515.

Acres, Gary James Keith; Cooper, Barry John; Diwell, Alan Francis; and Evans, William David James, to Johnson Matthey & Co., Limited. Catalyst for purifying automotive exhaust gases. 3,972,837, Cl. 252-473.000.

Adachi, Takeshi, to Nippon Gakki Seizo Kabushiki Kaisha. Automatic rhythm performance system. 3,972,258, Cl. 84-1.030.

Adachi, Yoshiharu: *See—*
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Adamoski, William, Jr.: *See—*
Foster, Dean Harold; and Adamoski, William, Jr., 3,972,525.

Adams, Frederick John, to Cam Gears Limited. Rack and pinion steering mechanism. 3,972,248, Cl. 74-498.000.

Adams, James E.; Dir, Gary A.; and Haas, Werner E. L., to Xerox Corporation. Imaging method. 3,972,588, Cl. 350-160.0LC.

Adams, John H., to Pittsburgh des Moines Steel Company. Floating roof having uniformly distributed buoyancy means. 3,972,444, Cl. 220-222.000.

Adamski, Leo J. Sailing craft. 3,972,300, Cl. 114-39.000.

Adkins, Allen H.: *See—*
Smith, Alexander M., II; Adkins, Allen H.; and Roth, Thomas M., Jr., 3,973,066.

Adolph, Dietrich; and Dinkelacker, Walter, to Robert Bosch G.m.b.H. Measuring transparency of gases, particularly the optical transmission of internal combustion engine exhaust gases. 3,973,123, Cl. 250-343.000.

Aeonic Press Company: *See—*
Smith, Bernard Francis, 3,972,449.

Aerojet-General Corporation: *See—*
Emigh, Willard F.; and Beichel, Rudi, 3,973,133.

Aetna-Standard Engineering Company: *See—*
Shaffer, Ralph M.; and Patejak, Jerzy F., 3,972,410.

Affiliated Hospital Products, Inc.: *See—*
Stern, Robert G.; and Mitchell, Larry D., 3,972,081.

Affolter, Peter; and Kach, Alfred, to Patelhold Patentverwertungs- und Elektro-Holding AG. Filter for electromagnetic waves. 3,973,226, Cl. 333-73.00R.

Agency of Industrial Science & Technology: *See—*
Kamei, Hirotake; Ozawa, Takeo; Nozaki, Ken; and Morikawa, Takitaro, 3,972,733.
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AGFA-Gevaert, A.G.: *See—*
Klein, Hans Joachim; Rupprecht, Manfred; Wonneberg, Heinz; and Geiger, Julius, 3,972,624.
Pfeifer, Josef; Schnall, Gunther; and Eppe, Rudolf, 3,972,609.
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Natens, Luc Yves; and De Gueldre, Jean Martha, 3,972,221.
Vanreusel, Gerard Laurens; and Bortels, Raoul Jan, 3,972,719.

Ahmed, Adel Abdel Aziz, to RCA Corporation. Current mirror amplifier. 3,973,215, Cl. 330-51.000.

Aid Corporation, The: *See—*
Watts, Max Welton, 3,972,293.

Aimar, Michele, to ITW Fastex Italia, S.p.A. Button and connecting member assembly. 3,972,093, Cl. 24-90.00B.

Aisin Seiki Kabushiki Kaisha: *See—*
Kawabata, Yasuhiro, 3,972,472.
Takayama, Katsuki; and Adachi, Yoshiharu, 3,972,382.

Akerberg, Dag E:son, to Telefonaktiebolaget L M Ericsson. Process for acknowledging calls in a system for wireless staff locators. 3,973,200, Cl. 325-55.000.

Aktiebolaget Atomenergi: *See—*
Roseen, Rutger Arvid, 3,972,548.

Aktiebolaget Tudor: *See—*
Sundberg, Erik G.; and Westberg, Erik, 3,972,728.

A.G. fur industrielle Elektronik AGIE Losone b. Locarno: *See—*
Ullmann, Werner; Ferroni, Bernardo; and Schumacher, Bernd, 3,973,104.

Akzona Incorporated: *See—*
Panneman, Harm Jan, 3,972,932.
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Alander, Dalton L.: *See—*
Larkins, Allan T., Jr.; and Alander, Dalton L., 3,972,811.

Albert, Eugene V., Jr., to Q Corporation. Printed circuit board support. 3,972,262, Cl. 90-19.000.

Albert, Kenneth J., to Thermo Seal. Drinking receptacle. 3,972,443, Cl. 220-90.400.

Albright, Charles F., to Garrett Corporation, The. Process for the selective synthesis of salicylaldehydes. 3,972,945, Cl. 260-600.00R.

Albright & Wilson Limited: *See—*
Collins, John Desmond; Coates, Harold; and Siddiqui, Iftikhar Hussain, 3,972,908.

Alevras, Constantino J. Hair stylist's haircutting helmet. 3,972,075, Cl. 2-174.000.

Alkasab, Kalil A., to Universal Oil Products Company. Solar energy collector with moving belt absorber. 3,972,316, Cl. 126-270.000.

Allard, Michael Duane: *See—*
Parish, Harold Cheney; Allard, Michael Duane; Pettit, Jack Leland; and Spulgis, Ivars Sigurds, 3,972,451.

Allen-Bradley Company: *See—*
Kuhn, Edward H., 3,973,094.

Allen, George E. Tying device for tying a wood framing structure to a masonry wall. 3,972,168, Cl. 52-698.000.

Allen, John Michael, to Raleigh Industries Limited. Bicycle freewheel. 3,972,245, Cl. 74-243.00R.

Allersma, Ties: *See—*
Hammel, Joseph J.; and Allersma, Ties, 3,972,720.
Hammel, Joseph J.; and Allersma, Ties, 3,972,721.

Allied Chemical Corporation: *See—*
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Allis-Chalmers Corporation: *See—*
Hansen, Kenneth N., 3,972,249.
Mecklenburg, Clifford G.; and Evans, Charles T., 3,972,434.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Classon, Ake, 3,973,077.

Alpha Engineering Corporation: *See—*
Rheinfelder, William A., 3,973,214.

Alt, Gerhard H.; and Street, Robert W., to Monsanto Company. N-phosphonomethylglycine phenyl hydrazides. 3,972,915, Cl. 260-502.500.

Altermatt, Hans, to Ciba-Geigy Corporation. Triazinyl dyes. 3,972,881, Cl. 260-249.000.

Alto Corporation: *See—*
Irving, Frank M., Jr.; and Schmidt, Albert S., Sr., 3,972,255.

Amada Company Limited: *See—*
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Amchem Products, Inc.: *See—*
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Amemiya, Hiroshi, to Tokyo Shibaura Electric Co., Ltd. Apparatus for recording information on a film. 3,973,130, Cl. 250-476.000.

American Cyanamid Company: *See—*
Asato, Goro, 3,972,895.
Kaizerman, Samuel; and Saxon, Robert, 3,972,857.
Susi, Peter Vincent; and Oppelt, John Christian, 3,972,927.

American Gas Association, Inc.: *See—*
Fessler, Raymond Roy; Berry, Warren Elmer; Wenk, Russell Lee; and Parkins, Redvers Nicholson, 3,973,056.

American Home Products Corporation: *See—*
Rosen, Harry, 3,973,029.
Strike, Donald P., 3,972,917.
Tsuk, Andrew G.; and Martin, Frederick H., 3,972,995.

American Home Products Corporation (Del.): *See—*
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American Medical Electronics Corporation: *See—*
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Turner, Robert Bruce, 3,972,237.

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American Thermostat Corporation: *See—*
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Ametek, Inc.: *See—*
DiSabatino, Roland, Jr.; Matthews, Henry W.; and Freeman, Mathew L., 3,972,504.
AMP Incorporated: *See—*
Casey, Daniel Thomas; and Over, William Roderick, 3,972,101.
Reynolds, Charles Edward; and Swartz, John Clinton, 3,972,578.
Ampex Corporation: *See—*
Ballard, Nathan Thomas, 3,972,786.
Anacker, Charles D. Dual purpose chair. 3,972,559, Cl. 297-1.000.
Anaconda Company, The: *See—*
Shiff, Milo B., 3,973,085.
Anderson, Gerald S.; Holm, John D.; Jacobson, Richard L.; and Smith, Ronald E., to Minnesota Mining and Manufacturing Company. Magnetic recording medium having binder-free phosphide coating. 3,973,072, Cl. 428-336.000.
Anderson, Paul S., to Merck & Co., Inc. Imidazothiazines, derivatives and analogues thereof. 3,973,017, Cl. 424-246.000.
Anderson, Raymond H.: *See—*
Appeldorn, Roger H.; and Anderson, Raymond H., 3,972,593.
Ando, Yujiro: *See—*
Moriyama, Inao; Tanaka, Keiji; Ando, Yujiro; and Ohara, Katsunobu, 3,972,608.
Andreas, David W.: *See—*
Brandberg, Lawrence C.; and Andreas, David W., 3,973,045.
Andren, Carl F., to NCR Corporation. PSK modulator with reduced spectrum occupancy. 3,973,201, Cl. 325-163.000.
Andrews, Charles Lee, III. Molding apparatus with additive metering and mixing means. 3,972,665, Cl. 425-205.000.
Andrews, James S.: *See—*
Evans, Brad D.; Werner, Charles E.; and Andrews, James S., 3,972,462.
Andrews, Richard A., to H. O. Trerice Co. Temperature recording intstrument. 3,973,265, Cl. 346-139.00R.
Angel, Henry R.; Oefinger, Arthur R.; and Hennessy, James W., to General Science Corporation. Hematology system. 3,973,189, Cl. 324-71.0CP.
Angelillo, Olindo R. Flue gas pollution eliminator. 3,972,696, Cl. 55-222.000.
Anritsu Electric Co., Ltd.: *See—*
Takahasi, Yoshiyuki; and Kawawa, Shigenobu, 3,972,625.
Anthony, Thomas R.; and Cline, Harvey E., to General Electric Company. Multiple p-n junction formation with an alloy droplet. 3,972,741, Cl. 148-1.500.
Anthony, Thomas R.: *See—*
Cline, Harvey E.; and Anthony, Thomas R., 3,972,742.
Antkowiak, Thomas A.: *See—*
Cheng, Tai Chun; Kyker, Gary S.; and Antkowiak, Thomas A., 3,972,841.
Anton, Herman: *See—*
Hagen, Siegfried Hendrik; van Osenbruggen, Cornelis; Anton, Herman; Reemers, Joseph; and Verspui, Gerrit, 3,972,797.
Antos, George J., to Universal Oil Products Company. Hydrocarbon conversion with an acidic multimetallic catalyst composite. 3,972,806, Cl. 208-139.000.
Anzai, Nobuo; and Kamaike, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Induction motor speed control apparatus. 3,973,175, Cl. 318-203.00R.
Anzai, Norio: *See—*
Nagase, Akira; Tsunematsu, Masayasu; Anzai, Norio; and Tomozawa, Akihiro, 3,972,756.
Aoyama, Kenji: *See—*
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Appeldorn, Roger H.; and Anderson, Raymond H., to Minnesota Mining and Manufacturing Company. Louvered echelon lens. 3,972,593, Cl. 350-211.000.
Arai, Akihiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera with automatic film advance. 3,973,268, Cl. 354-173.000.
Arant, Gene W.: *See—*
Bluestone, Dianne, 3,972,325.
Arant, Juanita F.: *See—*
Bluestone, Dianne, 3,972,325.
Arcari, Giuliana; Bernardi, Luigi; Bosisio, Germano; Glasser, Alfredo; and Sinatra, Innocenzio, to Societa Farmaceutici Italia S.p.A. 1,6-Dimethyl-8β-[2′ or 3′-pyrroyloxyethyl or substituted pyrroyloxyethyl]-10α-methoxyergolene compounds. 3,972,883, Cl. 260-285.500.
Arlauskas, Alfonsas; and Loose, Richard D., to General Motors Corporation. Inertia seat back lock. 3,972,564, Cl. 297-378.000.
Armbruster, Thomas L.; and Hill, Willliam N. Credit card. 3,972,138, Cl. 40-2.200.
Armitage, Harry J. Method and apparatus for shaping tungsten-carbide blanks. 3,972,151, Cl. 51-50.0PC.
Armstrong, Allen E. Bicycle shift mechanism. 3,972,247, Cl. 74-489.000.
Armstrong Cork Company: *See—*
Huber, Raymond B., 3,972,631.
Arnold, Emil; Crowell, Merton H.; and Stupp, Edward H., to North American Philips Corporation. Signal detector comprising field effect transistors. 3,973,146, Cl. 357-26.000.
Arnold, Wendell Ray, to Eli Lilly and Company. Herbicidal method. 3,972,706, Cl. 71-90.000.
Arnott, Robin A.; and Domaracki, John F., to International Tools (1973) Ltd. Roadway marker and reflector therefor. 3,972,586, Cl. 350-106.000.
Aro Manufacturing Company, Inc.: *See—*
Horn, Charles G., 3,972,558.
Arpe, Hans-Jurgen, to Hoechst Aktiengesellschaft. Process for preparing glycol dimethyl ethers. 3,972,949, Cl. 260-615.00R.
Arrow Development Co., Inc.: *See—*
Bacon, Karl W., 3,972,527.
Arte Vetrina s.r.l.: *See—*
Vivoli, Marcello, 3,972,638.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
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Asahi Kogaku Kogyo Kabushiki Kaitha: *See—*
Arai, Akihiro, 3,973,268.
Asato, Goro, to American Cyanamid Company. Benzothienylisothiocyanates. 3,972,895, Cl. 260-329.00S.
Aspin, Frank Metcalf. Roll assembly for use in profiling film. 3,972,671, Cl. 425-363.000.
Astheimer, Robert W., to Barnes Engineering Company. Infrared line scanning instrument. 3,973,124, Cl. 250-334.000.
Atlantic Richfield Company: *See—*
Uhl, George A., 3,972,567.
Attali, Georges; and Grimaldi, Pierre, to Schlumberger Limited. Method and apparatus for the determination of the thickness of a mudcake layer on a borehole wall traversing a subsurface earth formation. 3,973,188, Cl. 324-10.000.
Audiffred, Sidney J.; Bump, David W.; Erkkila, Raymond N.; Johnson, Lowell E.; and Pearce, Shairyl I., to Caterpillar Tractor Co. Slipping clutch controls responsive to wheel slip. 3,972,401, Cl. 192-109.00F.
Avela, Eero Sakari, to Suomen Sokeri Osakeyhtio. Method for selectively guiding and limiting the reactions of hydroxyl compounds. 3,972,868, Cl. 536-18.000.
Aylesworth, Robert D.: *See—*
Williams, Frederick R.; and Aylesworth, Robert D., 3,972,962.
Azuma, Shojiro. Automatic, remote operator for manually operable valve. 3,972,506, Cl. 251-133.000.
B.E. Industries, Inc.: *See—*
Bieser, Albert H.; and Stuhler, William B., 3,972,244.
B. H. Mfg., Inc.: *See—*
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Bacon, Karl W., to Arrow Development Co., Inc. Passenger powered rotating amusement ride. 3,972,527, Cl. 272-33.00R.
Badger Meter, Inc.: *See—*
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Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Mueller-Tamm, Heinz; Buechner, Oskar; Gierth, Volker; and Fauth, Karl-Heinz, 3,973,060.
Bagby Brattices, Inc.: *See—*
Bagby, James Allen, 3,972,272.
Bagby, James Allen, to Bagby Brattices, Inc. Mine brattice. 3,972,272, Cl. 98-50.000.
Bailey, Jay Richard, to McCulloch Corporation. Chain saw with a bifurcated diaphragm means providing a coaxial vibration-isolating unit. 3,972,119, Cl. 30-381.000.
Bailey, Paul T.: *See—*
Minnick, Robert C.; Bailey, Paul T.; Sandfort, Robert M.; and Semon, Warren L., 3,973,248.
Bajek, Walter A.: *See—*
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Naporano, Joseph F.; Baker, Benjamin A.; Tunkel, Steven J.; Grelecki, Chester; and Van Houten, George L., 3,972,481.
Baker, Don R., to Stauffer Chemical Company. Insecticidal and miticidal method. 3,973,009, Cl. 424-200.000.
Baker, Don R., to Stauffer Chemical Company. Organotin miticidal and insecticidal method. 3,973,012, Cl. 424-203.000.
Baker, Theodore C.: *See—*
Nolan, James F.; Baker, Theodore C.; Bode, Wolfgang W.; Mathias, Richard G.; and Pfaender, Lawrence V., 3,973,164.
Balestrini, Hector Alberto. Rods for erecting wire fences. 3,972,511, Cl. 256-47.000.
Ball Corporation: *See—*
Dollar, David L.; Giuliani, Raymond E.; Mirra, Michael J.; and Headrick, Jon W., 3,972,743.
Ballard, Nathan Thomas, to Ampex Corporation. Mechanically enhanced magnetic memory. 3,972,786, Cl. 204-32.00R.
Balle, Gerhard; Dieterich, Dieter; and Schaupp, Kurt, to Bayer Aktiengesellschaft. Mortar of inorganic binder and sulfonic acid group-containing formaldehyde condensation product with cycloalkanone. 3,972,723, Cl. 106-90.000.
Baran, John S.; and Liang, Chi-Dean, to G. D. Searle & Co. Antihyperlipidemic fatty acids and esters. 3,972,907, Cl. 260-410.90R.
Barbe, Gerard; Habault, Robert; and Tamet, Jean-Louis, to Rhone-Poulenc-Textile. Bicomponent polyester filaments and process for making same. 3,973,073, Cl. 428-370.000.
Barber, Walter G.: *See—*
Loxley, Ted A.; Barber, Walter G.; Combs, Walter W.; and Webb, John M., 3,972,704.
Bargain, Michel, to Rhone-Poulenc S.A. Heat-stable polyimide resin modified by unsaturated polyester. 3,972,960, Cl. 260-857.0PE.
Barker, Noble G.: *See—*
Goloff, Alexander; and Barker, Noble G., 3,972,658.
Barnes Drill Co.: *See—*
Zoiss, Melvin Howard, 3,972,161.

Barnes Engineering Company: *See—*
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Barrett, Joseph J.: *See—*
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Bruenemann, Hilmar; Stoeckelmann, Guenter; and Radtke, Volker, 3,972,849.
Pommer, Ernst-Heinrich; Kradel, Juergen; Koenig, Karl-Heinz; and Sanne, Walter, 3,973,018.
Voges, Dieter; Hupfer, Leopold; Winderl, Siegfried; Leonhard, Karl Wilhelm; and Hoffmann, Herwig, 3,972,938.
Battelle Development Corporation: *See—*
Giddey, Claude; and Rufer, Willy, 3,973,044.
Battelle Memorial Institute: *See—*
Schmitt, Reimar, 3,972,726.
Baum, Kurt, to Verfahrenstechnik Dr.-Ing. Kurt Baum. Process for avoiding formation of smoke and flames in bottom blown converters. 3,972,708, Cl. 75-60.000.
Baumann, George P.: *See—*
Machado, Roberto L.; Eisenberg, Benjamin; and Baumann, George P., 3,972,692.
Baumgardner, John D.; and Ebeling, Dorothy J., to Donnelly Mirrors, Inc. View expanding and directing optical system. 3,972,596, Cl. 350-286.000.
Baychem Corporation: *See—*
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Konig, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl-Georg, 3,972,869.
Konig, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl-Georg, 3,972,870.
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Metzger, Sidney H.; Kaufman, Marvin L.; and Over, John E., 3,972,910.
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Spielberger, Georg; and Hammerstrom, Knut, 3,972,939.
Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, 3,972,944.
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BBC Brown Boveri & Company Limited: *See—*
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Scheffer, Terry J., 3,972,587.
Beak, John H.; and Speer, Gordon W., to General Electric Company. Circuit for monitoring the inductance of an inductive load to indicate occurrence of a fault. 3,973,185, Cl. 324-51.000.
Beauchet, Jean; and Druge, Gerard, to Societe Nouvelle de Roulements. Machine tool for finish-grinding the inner surfaces of annular workpieces. 3,972,148, Cl. 51-5.00D.
Beaulieu, Marcel, to Beaulieu S.A. Cinecamera. 3,972,605, Cl. 352-72.000.
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Beaulieu, Marcel, 3,972,605.
Beccu, Klaus D.: *See—*
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Beghi, Rene, to Societe des Grands Travaux de Marseille. Take-up actuator. 3,972,508, Cl. 254-29.00A.
Begley, Richard F.; and Barrett, Joseph J., to Allied Chemical Corporation. Generation of coherent rotational anti-Stokes spectra. 3,973,134, Cl. 250-574.000.
Beguin, Pierre-Andre, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Electrically powered timepiece. 3,972,178, Cl. 58-85.500.
Behrenz, Wolfgang: *See—*
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Bekum Maschinenfabriken GmbH: *See—*
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Bell, Dale J. Needle point printing apparatus. 3,972,284, Cl. 101-327.000.
Bell Telephone Laboratories, Incorporated: *See—*
Blumberg, William Emil; Eisinger, Josef; and Lamola, Angelo Anthony, 3,973,129.
Embree, Milton Luther; and Goldthorp, David Clayton, 3,973,143.
Goldthorp, David Clayton, 3,973,141.
Hill, Donald Gifford, 3,973,142.
May, Carl Jerome, Jr., 3,973,086.
Belli, Luciano; and Toja, Ezio. Machine for assembling shoe uppers directly on assembly forms. 3,972,086, Cl. 12-7.900.
Beiser, Karl Arnold, to International Business Machines Corporation. Method and apparatus for point plotting of graphical data from a coded source into a buffer and for rearranging that data for supply to a raster responsive device. 3,973,245, Cl. 340-172.500.
Bendix Corporation, The: *See—*
Grabb, Frederick G., 3,972,191.
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Jannasch, Norman E.; and Hooton, Norris A., 3,972,395.
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Welsh, Harold H., Jr., 3,972,263.
Whiteside, Arliss Eugene; and Hornbuckle, John Aubrey, 3,973,243.
Benkowski, Frank J., to Warner & Swasey Company, The. Boom slider assembly. 3,972,571, Cl. 308-3.00R.
Bennett, Clarence L., Jr.; and Bohman, Carl E., to Sperry Rand Corporation. Speed-independent static magnetic field metal detector. 3,972,156, Cl. 56-10.200.
Beregi, Laszlo; Hugon, Pierre; Pascaud, Xavier; and Poignant, Jean-Claude, to Science Union et Cie. Disubstituted azabicycloalkanes. 3,972,994, Cl. 424-274.000.
Bergwerksverband GmbH: *See—*
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Berman, Gustave; and Brauch, Robert Barrett, to Singer Company Patent Department, The. Pretension threading device. 3,972,298, Cl. 112-254.000.
Bernaldo, Joe. Method for repair of plastic-cased batteries. 3,972,738, Cl. 136-174.000.
Bernardi, Luigi: *See—*
Arcari, Giuliana; Bernardi, Luigi; Bosisio, Germano; Glasser, Alfredo; and Sinatra, Innocenzio, 3,972,883.
Berney, Jean-Claude. Rotor for an electronically controlled micromotor. 3,973,153, Cl. 310-156.000.
Bernhardt, Gunther; and Trautvetter, Werner, to Dynamit Nobel Aktiengesellschaft. Process for making cross-linking shaped articles from copolymers of vinyl chloride. 3,972,847, Cl. 260-30.60R.
Bernier, John A.: *See—*
Walters, John P.; and Bernier, John A., 3,973,167.
Berry, Donnis M.: *See—*
Hall, David A.; Berry, Donnis M.; and Landis, Paul W., 3,972,793.
Berry, Warren Elmer: *See—*
Fessler, Raymond Roy; Berry, Warren Elmer; Wenk, Russell Lee; and Parkins, Redvers Nicholson, 3,973,056.
Bertea Corporation: *See—*
Jessee, James M., 3,972,188.
Bertrand, Jacques R., to Societe Parisienne d'Accessoires Automobiles Klippan, S.A.R.L. Seat belt buckle switch having plural operators. 3,973,093, Cl. 200-61.58B.
Bertus, Brent J., to Phillips Petroleum Company. Process for oxidative dehydrogenation. 3,972,954, Cl. 260-680.00E.
Bethlehem Steel Corporation: *See—*
Hiller, Carl D., 3,972,175.
Beuther, Harold; Kobylinski, Thaddeus P.; and Swift, Harold E., to Gulf Research & Development Company. Nitrogen oxide reduction system. 3,972,831, Cl. 252-432.000.
Bieber, James E., to Branson Ultrasonics Corporation. Method of forming over a plastic jacket against a workpiece using vibratory. 3,972,758, Cl. 156-73.100.
Bieser, Albert H.; and Stuhler, William B., to B.E. Industries, Inc. Variable drive bicycle transmission. 3,972,244, Cl. 74-217.00B.
Bigham, Robert C. Bucket and closure member apparatus. 3,972,147, Cl. 49-41.000.
Bilsens, Gunars; and Figueroa, Raymond Oscar, to Motorola, Inc. Combiner-demodulator for phase shift keyed suppressed carrier signals received over two transmission paths. 3,973,211, Cl. 329-105.000.
Biphase Engines, Inc.: *See—*
Hays, Lance G.; and Elliott, David G., 3,[illegible] '2,195.
Birch Brothers Southern, Inc.: *See—*
Straujups, John E., 3,972,486.
Bird, Jack Raymond, to Rolls-Royce (1971) Limited. Moulding apparatus for manufacturing bladed members from powder material. 3,972,662, Cl. 425-78.000.
Birdsong, Dwight C.: *See—*
Taylor, Julian S.; and Birdsong, Dwight C., 3,972,799.
Bischoff, Jean: *See—*
Montrose, Bjorne Thorwald, 3,972,562.
Bitjutskaya, Nina Alexandrovna: *See—*
Tsygankov, Mikhail Stepanovich; Bitjutskaya, Nina Alexandrovna; Fateeva, Vera Nikonorovna; Kosholkin, Valery Nikolaevich; Karev, Boris Dmitrievich; Kudinov, Nikolai Alexeevich; Kholkin, Mars Mikhailovich; Moiseev, Nikolai Nikiforovich; and Malandin, Oleg Georgievich, 3,972,736.
Black Clawson Company, The: *See—*
Notbohm, Willard C., 3,972,771.
Black and Decker Manufacturing Company, The: *See—*
Weber, Edwin Joseph; and Secoura, Ralph James, 3,973,179.
Black, Robert B. Air-abrasive prophylaxis equipment. 3,972,123, Cl. 32-58.000.

Blair Manufacturing Company: *See—*
Ryan, Kelly P., 3,972,484.

Blaw-Knox Foundry & Mill Machinery, Inc.: *See—*
Dugan, John M., 3,972,366.

Blazer, Donald G.: *See—*
Wolf, Charles B.; and Blazer, Donald G., 3,973,078.

Bleckmann & Co.: *See—*
Jagersberger, Adolf, 3,972,214.

Bleiman, Lewis William, to Pertec Corporation. Spindle drive motor. 3,972,535, Cl. 274-39.00A.

Bloomfield, David P.; and Cohen, Ronald, to United Technologies Corporation. Pressurized fuel cell power plant. 3,972,731, Cl. 136-86.00R.

Blues, Ernest Thomson: *See—*
Bryce-Smith, Derek; and Blues, Ernest Thomson, 3,972,830.

Bluestone, Dianne, to Arant, Gene W.; and Arant, Juanita F. Fingernail protector and method. 3,972,325, Cl. 128-132.00R.

Blumberg, William Emil; Eisinger, Josef; and Lamola, Angelo Anthony, to Bell Telephone Laboratories, Incorporated. Fluorimetric apparatus and method for analysis of body fluid. 3,973,129, Cl. 250-461.00B.

Board of Regents, State of Florida for and on behalf of the University of Florida: *See—*
Leonard, Chester D., 3,973,032.

Boch, Jean Christian: *See—*
Molle, Jean Louis; and Boch, Jean Christian, 3,973,031.

Bochnak, Gregory, to United Technologies Corporation. Leakage detector with back pressure sensor. 3,972,396, Cl. 188-312.000.

Bode, Wolfgang W.: *See—*
Nolan, James F.; Baker, Theodore C.; Bode, Wolfgang W.; Mathias, Richard G.; and Pfaender, Lawrence V., 3,973,164.

Bodet, Pierre. Changeable display device. 3,972,179, Cl. 58-85.500.

Bodycomb, Alistair K., to Domtar Limited. Electro-chemical corrosion of working elements. 3,972,482, Cl. 241-30.000.

Boeing Company, The: *See—*
Hamilton, Wilson S.; Katsumato, Malcolm T.; Lea, James M.; and Trepus, George E., 3,972,850.
Stanley, Charles R.; and Tillman, Russell I., 3,972,427.

Bohm, Manfred, to International Standard Electric Corporation. Radio direction finder with means for reducing sensitivity to multipath propogation errors. 3,973,262, Cl. 343-113.00R.

Bohman, Carl E.: *See—*
Bennett, Clarence L., Jr.; and Bohman, Carl E., 3,972,156.

Bohner, Beat; and Meyer, Willy, to Ciba-Geigy Corporation. Oxadiazolylphosphorus compounds for combatting insects and acarides. 3,973,011, Cl. 424-200.000.

Bohner, Beat: *See—*
Dawes, Dag; and Bohner, Beat, 3,973,010.

Bokros, Jack C., to General Atomic Company. Blood filter using glassy carbon fibers. 3,972,818, Cl. 210-435.000.

Bolduc, Lee R.; and Dickhudt, Eugene A., to Population Research Incorporated. Dispensing catheter. 3,972,331, Cl. 128-232.000.

Bolt Beranek and Newman, Inc.: *See—*
Brown, Neal A.; and Norton, John A., 3,972,646.

Bonney, Hugh F.: *See—*
Mueller, David J.; and Bonney, Hugh F., 3,973,228.

Book Covers, Inc.: *See—*
Carter, Leewood C., 3,972,632.

Bookwrights, Inc.: *See—*
Sendor, Mortimer S., 3,972,764.

Bopp, Warren G., to Eaton Corporation. Temperature responsive coupling. 3,972,399, Cl. 192-58.00B.

Boricheski, Joseph H., deceased (by Grabiek, Helen, executrix), to Johnson & Johnson. Orthopedic bandage. 3,972,323, Cl. 128-91.00R.

Borkowski, Casimer J., to United States of America, Energy Research and Development Administration. High temperature furnace. 3,973,075, Cl. 13-31.000.

Bortels, Raoul Jan: *See—*
Vanreusel, Gerard Laurens; and Bortels, Raoul Jan, 3,972,719.

Bosch, Paul; and Tittmann, Egon, to Robert Bosch G.m.b.H. Planetary gear motor having fixed and rotating sun gears. 3,972,659, Cl. 418-60.000.

Bosch, Paul: *See—*
Ital, Gunter; Fricke, Hans-Jurgen; and Bosch, Paul, 3,972,187.

Bosisio, Germano: *See—*
Arcari, Giuliana; Bernardi, Luigi; Bosisio, Germano; Glasser, Alfredo; and Sinatra, Innocenzio, 3,972,883.

Bosse, Andre. Electric air heating furnace. 3,973,101, Cl. 219-368.000.

Boswell, Gordon Henry, to Mason & Porter Limited. Rotary lawn mowers. 3,972,160, Cl. 56-255.000.

Botta, Artur, to Bayer Aktiengesellschaft. Process for preparing a 2(ω-aminoalkyl)-1,3-heterocyclic compounds. 3,972,890, Cl. 260-304.00R.

Bottka, Nicholas: *See—*
Hughes, Richard Swart; Bottka, Nicholas; and Hammond, Peter R., 3,973,216.

Boucher, Jean Raymond, to Northern Electric Company Limited. Device for filling multi-stranded electric cable. 3,972,304, Cl. 118-44.000.

Boughton, Stephen G.; and Wilkerson, James D., Jr., to General Electric Company. Aligning-securing apparatus for a refrigerator door. 3,972,550, Cl. 292-288.000.

Bourgoine, Michael L.: *See—*
Mason, Mark T.; and Bourgoine, Michael L., 3,972,622.

Bowcott, Roy Price, to Lucas Electrical Company Limited, The. Stator assembly for a dynamoelectric machine and method of manufacturing same. 3,973,151, Cl. 310-42.000.

Bowers, Frederic M.; Ambrus, Judith H.; Briggs, George S.; DeGraba, Michael E.; Green, Gary L.; Kushner, Allan S.; and Warburton, Donald L., to United States of America, Navy. Pyrotechnically activated lithium-chlorine cell. 3,972,730, Cl. 136-86.00A.

Bowman, Robert Mathews; and Gschwend, Heinz Werner, to Ciba-Geigy Corporation. Antiasthmatic 5,6-benzoisoindoline compositions. 3,973,030, Cl. 424-274.000.

Boxus, Philippe, to Station des Cultures Fruitieres et Maraicheres. Process for propagating strawberry plants. 3,972,146, Cl. 47-58.000.

BP Chemicals International Limited: *See—*
Fry, David Philip, 3,972,977.

Bradley, Daniel Joseph. Electron-optical image tubes. 3,973,117, Cl. 250-199.000.

Bradley, David N. Putting practice device. 3,972,532, Cl. 273-183.00C.

Brammer, Robert C. Reinforcing member for spaced flanges of a frame member. 3,972,170, Cl. 52-750.000.

Brandberg, Lawrence C.; and Andreas, David W., to Pillsbury Company, The. Popcorn package for microwave popping. 3,973,045, Cl. 426-110.000.

Brandes, Harry, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Sheet brake for printing press delivery. 3,972,523, Cl. 271-183.000.

Brandes, Wilhelm: *See—*
Buchel, Karl Heinz; Kramer, Wolfgang; Kaspers, Helmut; and Brandes, Wilhelm, 3,972,892.
Kramer, Wolfgang; Buchel, Karl Heinz; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 3,972,891.

Brannon, Donald Ray, to Eli Lilly and Company. Enzymatic deesterification of cephalosporin para-nitrobenzyl esters. 3,972,774, Cl. 195-29.000.

Branson Ultrasonics Corporation: *See—*
Bieber, James E., 3,972,758.

Brauch, Robert Barrett: *See—*
Berman, Gustave; and Brauch, Robert Barrett, 3,972,298.

Braun Aktiengesellschaft: *See—*
Cobarg, Claus Christian, 3,972,600.

Braun, Frank E., Jr.; and White, Wilmer, to United States of America, Army. Extended range tracer folded cup. 3,972,291, Cl. 102-87.000.

Braun, Fredrick J., to Houdaille Industries, Inc. Lubrication system with quick-change supply reservoir. 3,972,387, Cl. 184-28.000.

Brawn, Peter Nelson. Positive reinforcement respiratory inhalation device. 3,972,326, Cl. 128-210.000.

Breame, Stephen A., to Eaton Corporation. Vehicle steering mechanism. 3,972,538, Cl. 280-93.000.

Breault, Richard D., to United Technologies Corporation. Method for making electrodes for electrochemical cells. 3,972,735, Cl. 136-122.000.

Breed Corporation: *See—*
Breed, David S.; Husby, Harald S.; and Sung, Stanley, 3,973,092.

Breed, David S.; Husby, Harald S.; and Sung, Stanley, to Breed Corporation. Acceleration sensing switch of the liquid contact type having time delay structure. 3,973,092, Cl. 200-61.470.

Breitschwerdt, Werner, to Daimler-Benz Aktiengesellschaft. Retaining mechanism for the passengers of vehicles. 3,972,561, Cl. 297-216.000.

Bremer, Joannes Gregorius: *See—*
Rencs, Hendrik; and Bremer, Joannes Gregorius, 3,973,119.

Brennan, Bernard E. Sewage system. 3,972,650, Cl. 417-128.000.

Brennecke, Peter Wilhelm Reinhard: *See—*
Justi, Eduard Wilhelm Leonhard; Ewe, Henning; and Brennecke, Peter Wilhelm Reinhard, 3,973,192.

Bricknell, William H., to Canadair Flextrac Ltd. Automatic track tensioning system for tracked vehicle. 3,972,569, Cl. 305-10.000.

Briggs, George S.: *See—*
Bowers, Frederic M.; Ambrus, Judith H.; Briggs, George S.; DeGraba, Michael E.; Green, Gary L.; Kushner, Allan S.; and Warburton, Donald L., 3,972,730.

Brinkman, Robert J. Progressive knurl holder. 3,972,212, Cl. 72-102.000.

Brinza, Joseph E.: *See—*
Stock, Arthur J.; Christofer, Donald E.; and Brinza, Joseph E., 3,972,420.

Broadway, Alexander Richard William; Fong, William; and Rawcliffe, Gordon Hindle, to National Research Development Corporation. Electric motors. 3,973,154, Cl. 310-184.000.

Brockett, Frank Howard, III; and Sullivan, Arthur Francis, to International Nickel Company, Inc., The. Solids concentrator. 3,972,566, Cl. 299-8.000.

Brodeur, Ronald Joseph: *See—*
Neal, Robert Arthur; Savard, Guy; and Brodeur, Ronald Joseph, 3,972,357.

Broken Hill Proprietary Company Limited, The: *See—*
Debenham, Michael, 3,972,445.

Brown, Albert W., to International Telephone and Telegraph Corporation. Aircraft refueling system. 3,972,448, Cl. 222-14.000.

Brown, Claude H., to Halliburton Company. Object array placement device. 3,972,285, Cl. 102-22.000.

Brown, Melancthon S., deceased (by Kohn, Gustave, administrator), to Chevron Research Company. Fungicidal N-polyhalovinylthioformamides. 3,972,889, Cl. 424-298.000.

Brown, Neal A.; and Norton, John A., to Bolt Beranek and Newman, Inc. Propeller blade structures and methods particularly adapted for marine ducted reversible thrusters and the like for minimizing cavitation and related noise. 3,972,646, Cl. 416-228.000.

Brown, Perry H.; Tremblay, Maurice H.; and Surprenant, Norman F., to Brunswick Corporation. Method of making metal flocked fabric. 3,973,059, Cl. 427-180.000.

Bruenemann, Hilmar; Stoeckelmann, Guenter; and Radtke, Volker, to BASF Aktiengesellschaft. Production of resins. 3,972,849, Cl. 260-37.00P.

Brumm, Richard S., to Grove Valve and Regulator Company. Pressure surge relief system. 3,972,364, Cl. 137-485.000.

Brundl, Hermann: *See—*
Rabl, Carl-Roland; Rigler, Rudolf; Jovin, Thomas J.; Brundl, Hermann; and Simm, Wolfgang, 3,972,627.

Bruning Company: *See—*
Magnuson, Ruel D., 3,972,265.

Brunswick Corporation: *See—*
Brown, Perry H.; Tremblay, Maurice H.; and Surprenant, Norman F., 3,973,059.

Brush Wellman, Inc.: *See—*
Renschen, Patrick D., 3,972,712.

Bruun, Herta: *See—*
Feit, Peter Werner; Nielsen, Ole Bent Tvaermose; and Bruun, Herta, 3,972,886.

Bryce-Smith, Derek; and Blues, Ernest Thomson. Silver catalysts. 3,972,830, Cl. 252-430.000.

Buchel, Karl Heinz; Kramer, Wolfgang; Kaspers, Helmut; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. 1-[1,2,4-triazolyl-(1)]-2-aryloxy-3-hydroxy-alkanes. 3,972,892, Cl. 260-308.00R.

Buchel, Karl Heinz: *See—*
Kramer, Wolfgang; Buchel, Karl Heinz; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 3,972,891.

Buckley, Charles O.; and Bunn, Julian W., Jr., to Trienco, Inc. Hydrogen purifier. 3,972,695, Cl. 55-158.000.

Buckley, Keith; and Mitchell, John Richard, to Mars Limited. Pectate gelled food products and method. 3,973,051, Cl. 426-574.000.

Buckman, John D.; and Pera, John D., to Buckman Laboratories, Inc. Certain stabilized dithiocarbomate pesticidal compositions and methods of using same. 3,973,034, Cl. 424-286.000.

Buckman Laboratories, Inc.: *See—*
Buckman, John D.; and Pera, John D., 3,973,034.

Budde, Paul B.: *See—*
Livak, John E.; and Budde, Paul B., 3,973,039.

Buechner, Oskar: *See—*
Mueller-Tamm, Heinz; Buechner, Oskar; Gierth, Volker; and Fauth, Karl-Heinz, 3,973,060.

Bugaut, Andree: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,972,937.

Bull, Michael J.: *See—*
Searle, Robert J. G.; Woodall, Roger E.; and Bull, Michael J., 3,973,035.

Bump, David W.: *See—*
Audiffred, Sidney J.; Bump, David W.; Erkkila, Raymond N.; Johnson, Lowell E.; and Pearce, Shairyl I., 3,972,401.

Bunas, Bennie I.: *See—*
Uitti, Kenneth D.; and Bunas, Bennie I., 3,972,807.

Bunker, Carroll C.: *See—*
O'Cheskey, Theodore H.; Bunker, Carroll C.; and Edwards, Hugh T., Jr., 3,972,815.

Bunn, Julian W., Jr.: *See—*
Buckley, Charles O.; and Bunn, Julian W., Jr., 3,972,695.

Bunnelle, Philip R., to FMC Corporation. Discharge element for a liquid-gas separator unit. 3,972,352, Cl. 138-42.000.

Buntin, Robert R., to Exxon Research and Engineering Company. Battery separators made from polymeric fibers. 3,972,759, Cl. 156-167.000.

Burge, Donald G., to Parker-Hannifin Corporation. Shuttle valve. 3,972,343, Cl. 137-112.000.

Burgoon, Richard J., to Westinghouse Electric Corporation. Adjustable circuit-interrupter with improved support means. 3,973,096, Cl. 200-144.00B.

Burlington Industries, Inc.: *See—*
London, Joe F., Jr.; and Lauber, Jean-Louis, 3,972,174.

Burroughs Corporation: *See—*
Maloney, Thomas C., 3,973,166.
Wallace, Harry L., 3,972,522.

Bush Boake Allen Limited: *See—*
Mitchell, William, 3,973,052.

Bushnell, James D., to Exxon Research and Engineering Company. Immiscible coolant in propylene-acetone dewaxing. 3,972,802, Cl. 208-33.000.

Butler Automatic, Inc.: *See—*
Corcoran, Boyd L.; and Ronchinsky, Stanley, 3,973,174.

Butler, Walter J.: *See—*
Puckette, Charles M.; and Butler, Walter J., 3,973,138.

Butsch, Otto R.: *See—*
Morgan, Samuel A.; Irwin, Samuel N.; and Butsch, Otto R., 3,973,272.

Butter, Stephen A.; and Kaeding, Warren W., to Mobil Oil Corporation. Phosphorus-containing zeolite catalyst. 3,972,832, Cl. 252-437.000.

Cadwallader, James W., to Standard Pressed Steel Co. Vibration resistant fastener. 3,972,360, Cl. 151-22.000.

Cahill, David R.: *See—*
Markhart, Albert H.; and Cahill, David R., 3,973,055.

Calabrese, Richard A.; Estes, Ellis G.; Hopkins, Dean F.; and Johnson, Walter W., to United States of America, Army. Jet interaction nozzle. 3,972,479, Cl. 239-265.110.

Calderon, Albert. Pollution control of coke ovens. 3,972,780, Cl. 201-39.000.

Calfee, Richard W.: *See—*
Lovercheck, Lawrence R.; Hileman, Russell K.; and Calfee, Richard W., 3,973,244.

Calgon Corporation: *See—*
Tiggelbeck, Donald David; and Manes, Milton, 3,972,335.

Calvert, Thomas J., to Schlumberger Technology Corporation. High frequency method and apparatus for electrical investigation of subsurface earth formations surrounding a borehole containing an electrically non-conductive fluid. 3,973,181, Cl. 324-5.000.

Cam Gears Limited: *See—*
Adams, Frederick John, 3,972,248.

Cammack, Thomas A.: *See—*
Czajkowski, Norman; Donahue, William J.; Douglas, James M.; and Cammack, Thomas A., 3,972,290.

Camp, Wallace Jared: *See—*
Dillinger, Edward George; and Camp, Wallace Jared, 3,972,254.

Campbell, Robert E.: *See—*
Munden, Curtis D.; and Campbell, Robert E., 3,972,315.

Canadair Flextrac Ltd.: *See—*
Bricknell, William H., 3,972,569.

Canadian Patents and Development Limited: *See—*
Ringer, Thomas R., 3,972,497.

Cancilla, Philip S. Hydraulic jack incorporating rotatable power train in pump assembly. 3,972,509, Cl. 254-93.00H.

Canon, Jack Y. Bullet. 3,972,286, Cl. 102-38.000.

Canon Kabushiki Kaisha: *See—*
Hashimoto, Teiji; Matsumoto, Seiichi; Taguchi, Tetsuya; Kiyohara, Takehiko; and Tsunekawa, Tokuichi, 3,973,267.
Kakunodate, Masamichi; and Nakamoto, Soichi, 3,973,266.
Komori, Shigehiro; Goshima, Yoshitomo; Katayama, Hajime; and Miyamoto, Koichi, 3,972,612.
Moriyama, Inao; Tanaka, Keiji; Ando, Yujiro; and Ohara, Katsunobu, 3,972,608.
Suwa, Michiharu, 3,972,591.
Tanaka, Hiroshi; and Saito, Takashi, 3,972,611.

Cantrell, Ronald G., to Houdaille Industries, Inc. Method of and means for making lightweight, low cost impact resistant bumpers. 3,972,744, Cl. 148-12.400.

Carbonnel, Henri, to Groupement pour les Activities Atomiques et Avencees "GAAA". Rapid low-pressure casting installation. 3,972,369, Cl. 164-147.000.

Cardinal Industries Incorporated: *See—*
Johnston, Clifford V., 3,972,553.

Caretta, Renato, to Industrie Pirelli S.p.A. Process for automatically discharging a tire from the curing mold. 3,972,978, Cl. 264-334.000.

Carlson, Richard H.; and Ting, Youn H., to Texas Instruments Incorporated. Valve assembly with water dispersing and spreading system. 3,972,273, Cl. 99-300.000.

Carmien, Joseph Allen; and Yuhos, John R., to Nupla Corporation. Combined insert and end plug for fiberglass tool handles. 3,972,634, Cl. 403-13.000.

Carnahan, Robert D.: *See—*
Youtsey, Karl J.; Holt, William C., Jr.; Carnahan, Robert D.; and Spielberg, David H., 3,973,234.

Carpenter Technology Corporation: *See—*
Muzyka, Donald R.; and Whitney, Clyde Raymond, 3,972,713.

Carter, Cecil O., to Phillips Petroleum Company. Avoiding pollution by HF catalyst residues in alkylation. 3,972,956, Cl. 260-683.480.

Carter, Leewood C., to Book Covers, Inc. Expandable book cover. 3,972,632, Cl. 402-46.000.

Case Western Reserve University: *See—*
Caston, J. Douglas; and Kamen, Barton A., 3,972,991.

Casey, Daniel Thomas; and Over, William Roderick, to AMP Incorporated. Tool for trimming wires and inserting the trimmed wires into a connector. 3,972,101, Cl. 29-203.0MW.

Casey, James P.: *See—*
Walsh, David I.; and Casey, James P., 3,973,065.

Cash, Theodore Paul: *See—*
Holt, John P.; Cash, Theodore Paul; and Day, Delbert E., 3,972,722.

Casparro, John J., to Don Fedderson Productions Inc. Portable dynamic advertising display system. 3,972,140, Cl. 40-32.000.

Caston, J. Douglas; and Kamen, Barton A., to Case Western Reserve University. Radioisotopic assay and binder therefor. 3,972,991, Cl. 424-1.500.

Castro, Alberto Flores, to Luke, Thomas C. Machine for flattening dough buns and the like. 3,972,672, Cl. 425-367.000.

Catalyst Research Corporation: *See—*
King, Ellwood J., 3,972,734.

Caterpillar Tractor Co.: *See—*
Audiffred, Sidney J.; Bump, David W.; Erkkila, Raymond N.; Johnson, Lowell E.; and Pearce, Shairyl I., 3,972,401.
Chamberlain, Richard W., 3,972,398.
Clarke, John M.; and Staebler, Paul J., 3,972,657.
Codo, Edward A.; and Larson, Donald J., 3,972,464.
Engel, Simon L.; and Peters, Laurence R., 3,972,599.
Field, Jesse L., Jr.; and Medina, Glen J., 3,972,264.
Fischer, Robert Louis, 3,972,431.
Goloff, Alexander; and Barker, Noble G., 3,972,658.

Haak, Willard J.; Marsden, Howard A.; and Sturges, James R., 3,972,267.
Houriez, Gerard P. A. J.; and Van Wuytswinkfl, Charles M. G., 3,972,378.
Howells, Norman B., 3,972,400.
Humphreys, Rex T.; and Medina, Glenn J., 3,972,186.
Jackson, George James, 3,972,342.
Johnson, Roger W., 3,972,644.
Mangus, Ervin E., 3,972,660.
Massieon, Charles G., 3,972,570.
Medina, Glenn J., 3,972,185.
Orr, Robert S., 3,972,106.

Caunt, Anthony David: *See—*
Fortuin, Michael Stanley; and Caunt, Anthony David, 3,972,866.

Celanese Corporation: *See—*
Clark, Roger T., 3,972,952.
Ochiai, Shinya; and Griffith, Leonard, 3,972,946.

Centofanti, Louis F., to Monsanto Company. Process for removing fluorine compounds from phosphoric acid. 3,972,982, Cl. 423-321.00S.

Centre National d'Etudes Spatiales: *See—*
Mosetti, Jacques; Beccu, Klaus D.; and Jonville, Pierre, 3,972,729.

Cereijo, Manuel Ramon; and Dougherty, Timothy Stephen, to Western Electric Company, Inc. Sensing capacitance and thickness of insulated cable to provide outputs related to weigh and percent voids. 3,973,187, Cl. 324-61.00R.

Cerni, Todd A.; and Krider, Edmund Philip, to United States of America, Navy. Transient event data acquisition apparatus for use with radar systems and the like. 3,973,258, Cl. 343-5.00W.

Cerrone, Marcello: *See—*
Rio, Arturo; Cerrone, Marcello; and Saini, Alberto, 3,972,969.

Cessna, Lawrence C., Jr., to Hercules Incorporated. Pressless injection molding apparatus. 3,972,668, Cl. 425-242.00R.

Cetenko, Wiaczeslaw A.: *See—*
Morrison, Glenn C.; and Cetenko, Wiaczeslaw A., 3,973,016.

Chamberlain, Richard W., to Caterpillar Tractor Co. Parking brake and transmission valve interlock. 3,972,398, Cl. 192-4.00A.

Champleboux, Jacques; Tailhardat, Franck; and Moreau, Charles, to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes. Self-floating flexible pipe. 3,972,354, Cl. 138-103.000.

Chan, Bock G.: *See—*
Stanley, William L.; Elliger, Carl A.; and Chan, Bock G., 3,972,918.

Chance, Leon H.; and Moreau, Jerry P., to United States of America, Agriculture. 1-(1H,1H-perfluorooctyl)-1,3-trimethylenediphosphonic tetrachloride. 3,972,924, Cl. 260-543.00P.

Change, Inc.: *See—*
Mail, Paul; Ferrin, Charles R.; and Ely, Richard J., 3,972,816.

Channin, Donald Jones; and Priestley, Eldon Bruce, to RCA Corporation. Method of preparing a liquid crystal display. 3,973,057, Cl. 427-162.000.

Chao, Albert; and Fantigrossi, Frank. Self-cleaning mechanism for twin blade razors. 3,972,114, Cl. 30-41.000.

Charles, Joel Marie; and Ghiglione, Jean-Pierre Maurice, to Etat Francais represented by Delegation Ministerielle pour l'Armement. Isobaric device with rotating electrical contacts. 3,972,577, Cl. 339-5.00L.

Chauvigne, Michel, to Etablissements Carpano & Pons. Valve for water sprinklers and the like. 3,972,344, Cl. 137-119.000.

Cheek, Forrest R., to General Motors Corporation. Torque converter and slipping clutch assembly. 3,972,397, Cl. 192-3.300.

Chemical Separations Corporation: *See—*
Chopra, Randhir C., 3,972,810.

Chemische Werke Huls Aktiengesellschaft: *See—*
de Jong, Rudolf, 3,972,843.
Wulf, Horst-Dieter; List, Ferdinand; Orlowski, Friedrich-August; Wilke, Norbert; and Pflegerl, Emmerich, 3,972,912.

Chen, James Ling, to E. R. Squibb & Sons, Inc. Surgical bandage. 3,972,328, Cl. 128-156.000.

Cheng, Tai Chun; Kyker, Gary S.; and Antkowiak, Thomas A., to Firestone Tire & Rubber Company, The. Polyphosphazene elastomer with up to 35 mole per cent non-fluorinated alkoxy groups having improved low temperature flexibility. 3,972,841, Cl. 260-2.00P.

Cherkashin, Jury Ivanovich: *See—*
Sidorenko, Mikhail Kirillovich; Cherkashin, Jury Ivanovich; and Lopatin, Nikolai Nikolaevich, 3,972,204.

Chevron Research Company: *See—*
Brown, Melancthon S., deceased, 3,972,889.
Hudson, Thomas A.; and Strickland, Gordon E., Jr., 3,972,199.

Chia, Enrique C.; and Forberg, Helge Ole, to Southwire Company. Method for dispersing gas into a molten metal. 3,972,709, Cl. 75-93.00R.

Chiba, Moichi; and Higuchi, Seiji, to Torrington Company, The. Cage for roller bearing. 3,972,575, Cl. 308-235.000.

Chicago Bridge & Iron Company: *See—*
Van Gelder, Louis Ralph, 3,972,180.

Chopra, Randhir C., to Chemical Separations Corporation. Removal of chromium, chromate, molybdate and zinc. 3,972,810, Cl. 210-33.000.

Christofer, Donald E.: *See—*
Stock, Arthur J.; Christofer, Donald E.; and Brinza, Joseph E., 3,972,420.

Christy, Marcia Elizabeth, to Merck & Co., Inc. 10,11-Dihydro-5-(3-amino-propyl-or-propylidene)-10,10,11,11-tetra-fluoro-5H-dibenzo[a,d]cycloheptenes and-5-ols. 3,972,936, Cl. 260-570.8TC.

Chubb, Talbot A. Gas dissociation thermal power system. 3,972,183, Cl. 60-641.000.

Ciarcia, Ronald David; and McGann, James Edward, Jr., to General Electric Company. Circuit breaker accessories incorporating improved auxiliary switch. 3,973,230, Cl. 335-13.000.

Ciba-Geigy AG: *See—*
Fahrni, Fritz, 3,973,062.
Schwank, Max, 3,972,675.

Ciba-Geigy Corporation: *See—*
Altermatt, Hans, 3,972,881.
Bohner, Beat; and Meyer, Willy, 3,973,011.
Bowman, Robert Mathews; and Gschwend, Heinz Werner, 3,973,030.
Dawes, Dag; and Bohner, Beat, 3,973,010.
Drabek, Jozef, 3,973,014.
Goschke, Richard, 3,973,022.
Haas, Georges; and Sallmann, Alfred, 3,973,024.
Liechti, Hans Wilhelm; and Defago, Raymond, 3,972,676.

Ciric, Julius, to Mobil Oil Corporation. Crystalline zeolite ZSM-20 and method of preparing same. 3,972,983, Cl. 423-328.000.

Cities Service Research & Development Co.: *See—*
Gregoli, Armand A., 3,972,801.

Clack, Peter Joseph; Levin, Herman Wesley; and Mergner, George Clarence, to Leeds & Northrup Company. Flow-through thermal detector. 3,972,681, Cl. 23-253.00R.

Clark, Roger T., to Celanese Corporation. Vapor-phase conversion of methanol and ethanol to higher linear primary alcohols by heterogeneous catalysis. 3,972,952, Cl. 260-642.00R.

Clarke, John M.; and Staebler, Paul J., to Caterpillar Tractor Co. Slant axis rotary mechanism. 3,972,657, Cl. 418-53.000.

Clarke, Robert L.: *See—*
Daum, Sol J.; and Clarke, Robert L., 3,972,930.

Classon, Ake, to Allmanna Svenska Elektriska Aktiebolaget. Bushing for electrical connection. 3,973,077, Cl. 174-15.0BH.

Clavel, Raymond: *See—*
Menzi, Ulrich; and Clavel, Raymond, 3,972,404.

Clayton Dewandre Company Limited: *See—*
Hudston, Michael R.; and Levington, Henry J., 3,972,557.

Clayton Manufacturing Company: *See—*
Clayton, William; and Mattox, George W., 3,972,654.

Clayton, William; and Mattox, George W., to Clayton Manufacturing Company. Diaphragm pump boiler feed water system. 3,972,654, Cl. 417-388.000.

Clayton, William Joseph, to Mobil Oil Corporation. Spot blocked thermoplastic film laminate. 3,973,063, Cl. 428-35.000.

Cleeland, Roy, Jr.; and Hager, Hans Jacob, to Hoffmann-La Roche Inc. Diagnostic test for opium alkaloids. 3,972,992, Cl. 424-12.000.

Cline, Harvey E.; and Anthony, Thomas R., to General Electric Company. Deep power diode. 3,972,742, Cl. 148-1.500.

Cline, Harvey E.: *See—*
Anthony, Thomas R.; and Cline, Harvey E., 3,972,741.

Cloyd, Harold S., to Nosco Plastics, Inc. Syringe. 3,972,330, Cl. 128-220.000.

Coates, Harold: *See—*
Collins, John Desmond; Coates, Harold; and Siddiqui, Iftikhar Hussain, 3,972,908.

Cobarg, Claus Christian, to Braun Aktiengesellschaft. Mirror with adjustable focal distance. 3,972,600, Cl. 350-295.000.

Codo, Edward A.; and Larson, Donald J., to Caterpillar Tractor Co. Friction welded filter housing. 3,972,464, Cl. 228-112.000.

Cohen, Ronald: *See—*
Bloomfield, David P.; and Cohen, Ronald, 3,972,731.

Cohn, Ernest M., to United States of America, National Aeronautics and Space Administration. Rechargeable battery which combats shape change of the zinc anode. 3,972,727, Cl. 136-30.000.

Colas, Guy, to Institut National de la Recherche Agronomique. Process for the preservation of ram semen by freezing. 3,973,003, Cl. 424-105.000.

Coler, Benjamin W., to Honeywell Inc. Means for making an electrical connector. 3,972,102, Cl. 29-206.00D.

Collins, Floyd Keith, to GTE Sylvania Incorporated. Cathode support means for a CRT electron generating assembly. 3,973,162, Cl. 313-417.000.

Collins, Floyd Keith, to GTE Sylvania Incorporated. Heater support positioning in a CRT electron generating assembly. 3,973,163, Cl. 313-417.000.

Collins, John Desmond; Coates, Harold; and Siddiqui, Iftikhar Hussain, to Albright & Wilson Limited. Organotin compounds. 3,972,908, Cl. 260-429.700.

Collins, Wesley A. Pants and skirt hanger. 3,972,455, Cl. 223-96.000.

Collins, William O. Visual approach and landing system for aircraft with supplementary indicating and warning devices. 3,972,125, Cl. 33-227.000.

Combroux, Jean: *See—*
Schirmann, Jean-Pierre; Combroux, Jean; and Delavarenne, Serge Yvon, 3,972,878.

Combs, Walter W.: *See—*
Loxley, Ted A.; Barber, Walter G.; Combs, Walter W.; and Webb, John M., 3,972,704.

Comco, Inc.: *See—*
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Commercial Resins Company: *See—*
Hart, Robert J., 3,972,149.

Compucorp: *See—*
Stoesser, Wolfgang R.; Wills, Connable F.; and Sperling, Irving, 3,973,256.

Computer Peripherals, Inc.: *See—*
Swatik, Donald S.; Malakian, Vahe H.; and Mishark, Joseph E., 3,972,280.

Computervision Corporation, The: *See—*
Levy, Kenneth; Corbin, David; Fleming, Alan J.; Friedman, David; Fryklund, Gilbert G.; Parker, Vance; and Schliemann, Gerd, 3,972,424.

Condolios, Elie, to Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM). Dredging installation. 3,972,137, Cl. 37-56.000.

Conkon, Edward James; DeStephanis, Ralph; and Hitch, Thomas Tipton, to RCA Corporation. Wire placement fixture. 3,972,463, Cl. 228-44.10A.

Connor, David T.; Young, Patricia A.; and von Strandtmann, Maximilian, to Warner-Lambert Company. 3-(2-Pyridinyl)-4(1H)-cinnolinone N-oxides. 3,973,020, Cl. 424-250.000.

Conrad, Rene, to Dynaloc Corporation. Self-centering idler rollers for troughing conveyer belting. 3,972,414, Cl. 198-202.000.

Consortium fur Elektrochemische Industrie GmbH: *See—*
Muller, Frank; Haberle, Norman; and Kinzel, Peter, 3,972,707.

Cooper, Barry John: *See—*
Acres, Gary James Keith; Cooper, Barry John; Diwell, Alan Francis; and Evans, William David James, 3,972,837.

Cooper, Daniel A. Tape dispenser having snap lock core members. 3,972,459, Cl. 225-47.000.

Cope, Raymond. Dental instrument tray device. 3,972,120, Cl. 32-22.000.

Coperthwaite, William S. Concentric building. 3,972,163, Cl. 52-82.000.

Corbin, David: *See—*
Levy, Kenneth; Corbin, David; Fleming, Alan J.; Friedman, David; Fryklund, Gilbert G.; Parker, Vance; and Schliemann, Gerd, 3,972,424.

Corcoran, Boyd L.; and Ronchinsky, Stanley, to Butler Automatic, Inc. Digital control system. 3,973,174, Cl. 318-6.000.

Cornelius, Gerhard; Jockel, Heinz; and Kupfer, Hans, to Metallgesellschaft Aktiengesellschaft. Reactor for cracking hydrocarbons. 3,972,688, Cl. 23-288.00K.

Cornell, Charles R.: *See—*
Knapp, Kenneth K.; Cornell, Charles R.; and Hicks, Edwin D., 3,972,189.

Cornell Research Foundation, Inc.: *See—*
Kosikowski, Frank V.; and Jolly, Ramesh C., 3,973,042.
Tang, Chung L.; and Telle, John Martin, 3,973,219.

Cortner, William C., Jr., to Dale Alley Co. End opening dusting bag. 3,972,309, Cl. 119-159.000.

Costa, Armando, to Ing. C. Olivetti & C., S.p.A. Loading device for reels of paper tape. 3,972,487, Cl. 242-68.700.

Costantini, Ralph J.; Parsons, Charles R.; and Schretter, Stanley J., to United States of America, Army. Dispersed pulse measurement for AGC and dynamic thresholding of a chirped radar receiver. 3,973,260, Cl. 343-17.2PC.

Costello, Matthew J.; Dolan, Donald T.; Debaudringhien, Andre T.; Hurkmans, Antoon M.; Jasinski, Kenneth R.; and Keplinger, Edward G., to Graphic Sciences, Inc. Stylus assembly for facsimile receiver. 3,973,264, Cl. 346-139.00A.

Costolow, John J., to Phillips Petroleum Company. Color control of polypropylene. 3,972,854, Cl. 260-23.00H.

Coulter Electronics, Inc.: *See—*
Hogg, Walter R., 3,973,108.
Hogg, Walter R., 3,973,196.

Courbet, Pierre; and Le Marchand, Claude, to Societe Anonyme D.B.A. Friction pad and support for a disc brake. 3,972,393, Cl. 188-73.300.

Court, Kenneth, to Sperry Rand Corporation. Pilot operated relief valve. 3,972,345, Cl. 137-490.000.

Cox Foundry & Machine Company: *See—*
Sparling, Robert O., 3,972,355.

Cox, James F., Jr. Inflatable body balloon. 3,972,526, Cl. 272-1.00D.

Cozar, Ricardo: *See—*
Honnorat, Yves; Pineau, Andre; and Cozar, Ricardo, 3,972,752.

Crabtree, Eleanor V.: *See—*
Poziomek, Edward J.; and Crabtree, Eleanor V., 3,972,783.

Creusot-Loire: *See—*
Honnorat, Yves; Pineau, Andre; and Cozar, Ricardo, 3,972,752.

Criscimagna, Tony N.; and Piston, Albert O., to International Business Machines Corporation. Floating addressing system for gas panel. 3,973,253, Cl. 340-324.00M.

Croley, Thomas E., to Comco, Inc. Drum-like fiberboard container for bulk material with frangible bottom closure for dispensing. 3,972,454, Cl. 222-541.000.

Crowell, Merton H.: *See—*
Arnold, Emil; Crowell, Merton H.; and Stupp, Edward H., 3,973,146.

Cunningham, William Eric. Apparatus for determining the concentration of microorganisms. 3,972,778, Cl. 195-139.000.

Curry, John B.: *See—*
Paszyc, Aleksy J.; Pal, Dharam; and Curry, John B., 3,972,814.

CVI Corporation: *See—*
Parish, Harold Cheney; Allard, Michael Duane; Pettit, Jack Leland; and Spulgis, Ivars Sigurds, 3,972,451.

Cyprus Metallurgical Processes Corporation: *See—*
Goens, Duane N.; and Kruesi, Paul R., 3,972,711.

Czajkowski, Norman; Donahue, William J.; Douglas, James M.; and Cammack, Thomas A., to United States of America, Navy. Flywheel type odometer safing and arming mechanism. 3,972,290, Cl. 102-79.000.

Daimler-Benz Aktiengesellschaft: *See—*
Breitschwerdt, Werner, 3,972,561.

Dale Alley Co.: *See—*
Cortner, William C., Jr., 3,972,309.

Dalgleish, Jack F.; and Lukas, Helmut H., to Northern Electric Company Limited. Connectors for optical fibers. 3,972,585, Cl. 350-96.00C.

Dana Corporation: *See—*
Harris, Ralph E., 3,973,098.

Dantoni, Joseph L. Method of making animal litter. 3,972,971, Cl. 264-115.000.

Dash, Edward, to McDonnell Douglas Corporation. Surface preparation method. 3,972,111, Cl. 29-458.000.

Data Printer Corporation: *See—*
Konkel, Joseph, 3,972,282.

Datis, Angelo P., to Process Products, Inc. Vapor recovery system. 3,972,201, Cl. 62-54.000.

Datwyler, Walter Frederick, Jr.: *See—*
Presley, Rex Wallace; Datwyler, Walter Frederick, Jr.; and Lorraine, Jack Richardson, 3,972,543.

Daugherty, Harold R.: *See—*
Miller, Paul J.; and Daugherty, Harold R., 3,972,340.

Daum, Sol J.; and Clarke, Robert L., to Sterling Drug Inc. Aminocyclitol antibiotics. 3,972,930, Cl. 260-563.00R.

Dawans, Francois; and Nicolas, Denise, to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf. Cyanocarboxylate polymers and their process of manufacture. 3,972,867, Cl. 526-14.000.

Dawes, Dag; and Bohner, Beat, to Ciba-Geigy Corporation. Insecticidal and acaricidal composition and method with triazolyl phosphoric esters acid. 3,973,010, Cl. 424-200.000.

Day, Delbert E.: *See—*
Holt, John P.; Cash, Theodore Paul; and Day, Delbert E., 3,972,722.

Debaudringhien, Andre T.: *See—*
Costello, Matthew J.; Dolan, Donald T.; Debaudringhien, Andre T.; Hurkmans, Antoon M.; Jasinski, Kenneth R.; and Keplinger, Edward G., 3,973,264.

Debenham, Michael, to Broken Hill Proprietary Company Limited, The. Easy-opening container ends. 3,972,445, Cl. 220-268.000.

Decca Limited: *See—*
Phipps, Derek John, 3,973,261.

DeChristopher, Phillip J.: *See—*
Eppensteiner, Frederick W.; and DeChristopher, Phillip J., 3,972,789.

Deeter, Ronald C.; and Pozniko, John, to Salem Tool Company, The. Auger drive with auxiliary powertrain boxes. 3,972,375, Cl. 173-50.000.

Defago, Raymond: *See—*
Liechti, Hans Wilhelm; and Defago, Raymond, 3,972,676.

Defosse, Georges Jean-Pierre Hubert, to Elphiac. Apparatus for fabricating monocrystals. 3,972,684, Cl. 23-273.0SP.

deGarcia, Horacio J., Jr.: *See—*
Zimmermann, Vincent H.; deGarcia, Horacio J., Jr.; and Pierson, Harlan K., 3,972,490.

DeGraba, Michael E.: *See—*
Bowers, Frederic M.; Ambrus, Judith H.; Briggs, George S.; DeGraba, Michael E.; Green, Gary L.; Kushner, Allan S.; and Warburton, Donald L., 3,972,730.

De Gueldre, Jean Martha: *See—*
Natens, Luc Yves; and De Gueldre, Jean Martha, 3,972,221.

Dehlinger, Peter Jean. Wind mosaic glasses. 3,972,319, Cl. 128-1.00C.

Dehmer, Klaus: *See—*
Finke, Manfred; Kleiner, Hans-Jerg; Stahler, Gerhard; and Dehmer, Klaus, 3,972,923.

Deike, Robert F., to Foresight Industries. Method of forming shear sections in posts. 3,972,107, Cl. 29-401.00R.

de Jong, Rudolf, to Chemische Werke Huls Aktiengesellschaft. Expandable styrene polymers suitable for the production of quickly moldable cellular bodies. 3,972,843, Cl. 260-2.50B.

Delavarenne, Serge Yvon: *See—*
Schirmann, Jean-Pierre; Combroux, Jean; and Delavarenne, Serge Yvon, 3,972,878.

de Lissa, Richard C. F.; and Schwarze, Walter G., to MacMillan Bloedel Limited. Flame-proof cellulosic product. 3,973,074, Cl. 428-537.000.

della Porta, Paolo: *See—*
Giorgi, Tiziano A.; and della Porta, Paolo, 3,973,157.

DeMuro, Frank P.; and Rapino, Norman G. Method and apparatus for drying hair. 3,972,126, Cl. 34-3.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Yamashita, Mitsuo; Mikogami, Akio; Hasegawa, Masashi; and Oizumi, Hiroshi, 3,972,838.

DePenti, Kenneth L., to Midland-Ross Corporation. Car coupler. 3,972,421, Cl. 213-127.000.

DePetris, Peter S. Electronic choke control. 3,972,311, Cl. 123-119.00F.

Derderian, Carl; and Miller, Robert, to Uniroyal Inc. Manufacture of vulcanized elastomeric hose. 3,972,757, Cl. 156-143.000.

Despot, Janko; and Simeth, Claus, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Sheet intercept mechanism to permit removal of delivery pile in printing press. 3,972,524, Cl. 271-218.000.

DeStephanis, Ralph: *See—*
Conlon, Edward James; DeStephanis, Ralph; and Hitch, Thomas Tipton, 3,972,463.
Dethloff, Heinz: *See—*
Feess, Erich; and Dethloff, Heinz, 3,972,677.
Deutsch, Ralph, to Nippon Gakki Seizo Kabushiki Kaisha. Production of pulse width modulation tonal effects in a computor organ. 3,972,259, Cl. 84-1.240.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
von Bebenburg, Walter; and Offermanns, Heribert, 3,972,873.
de Winter, Max Salomon: *See—*
van den Broek, Albertus Joannes; and de Winter, Max Salomon, 3,972,906.
Diamond, Donald A., to Dovey Manufacturing Company. Capacitor detector device. 3,973,208, Cl. 328-5.000.
Diamond Shamrock Corporation: *See—*
Horn, Herman; Greenbaum, Sheldon B.; Ely, Charles M.; Hacke, Walter; and Olle, David A., 3,973,021.
Lasco, Ralph H., 3,972,942.
Dickhudt, Eugene A.: *See—*
Bolduc, Lee R.; and Dickhudt, Eugene A., 3,972,331.
Dickopp, Gerhard; Jahnel, Benno; Rainer, Wolfgang; and Dummen, Paul Ludwig, to TED Bildplatten Aktiengesellschaft, AEG-Telefunken, TELDEC. Playback device for a disc-shaped record carrier with transducer lifting for changing playback groove for fast, slow or stop effects. 3,973,080, Cl. 178-6.60R.
Dieterich, Dieter: *See—*
Balle, Gerhard; Dieterich, Dieter; and Schaupp, Kurt, 3,972,723.
Dillinger, Edward George; and Camp, Wallace Jared, to Kemos Incorporated. Cutting mechanism and method for cutting or slicing strips fed thereto. 3,972,254, Cl. 83-4.000.
Di Martino, John M. Tandem midlock. 3,972,425, Cl. 214-10.50R.
DiMartino, John M. Horizontal connector for shipping containers. 3,972,439, Cl. 214-10.50R.
Dingwall, Andrew Gordon Francis, to RCA Corporation. Low power counting circuits. 3,973,139, Cl. 307-225.00C.
Dinkelacker, Walter: *See—*
Adolph, Dietrich; and Dinkelacker, Walter, 3,973,123.
Dipl.-Ing. Hanns Frohler KG: *See—*
Frohler, Hanns; and Rossberger, Erwin, 3,972,796.
Dir, Gary A.: *See—*
Adams, James E.; Dir, Gary A.; and Haas, Werner E. L., 3,972,588.
Dirks, Arthur A.; and Meyers, William G. Trailer anti-jackknifing apparatus. 3,972,542, Cl. 280-432.000.
DiSabatino, Roland, Jr.; Matthews, Henry W.; and Freeman, Mathew L., to Ametek, Inc. Main steam isolation check valve. 3,972,504, Cl. 251-82.000.
DiSantis, Madeleine E.: *See—*
Kopf, Rowland J., 3,972,229.
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Diwell, Alan Francis: *See—*
Acres, Gary James Keith; Cooper, Barry John; Diwell, Alan Francis; and Evans, William David James, 3,972,837.
Dixon, Guy E., to Panelfold Doors, Inc. (Entire). Extruded plastic folding door. 3,972,365, Cl. 160-183.000.
Doentremont, Donald J., to W. R. Grace & Co. Coating composition for polyethylene films comprising EPR and polybutene. 3,972,964, Cl. 260-897.00A.
Dohn, Walter R. F. Board baseball game. 3,972,530, Cl. 273-88.000.
Dohrendorf, Franz, to Nordischer Maschinenbau Rud. Baader. Device for severing the heads of fishes. 3,972,091, Cl. 17-55.000.
Dolan, Donald T.: *See—*
Costello, Matthew J.; Dolan, Donald T.; Debaudringhien, Andre T.; Hurkmans, Antoon M.; Jasinski, Kenneth R.; and Keplinger, Edward G., 3,973,264.
Dolgov, Anatoly Vladimirovich: *See—*
Voitsekhovsky, Bogdan Vyacheslavovich; and Dolgov, Anatoly Vladimirovich, 3,972,514.
Dollar, David L.; Giuliani, Raymond E.; Mirra, Michael J.; and Headrick, Jon W., to Ball Corporation. High strength, stable zinc-aluminum alloy. 3,972,743, Cl. 148-11.50R.
Dolling, Ulf-H.; Grabowski, Edward J. J.; Schoenewaldt, Erwin F.; and Sletzinger, Meyer, to Merck & Co., Inc. Synthesis of racemic 2-deutero-3-fluoro-alanine and its salts. 3,972,921, Cl. 260-534.00C.
Domaracki, John F.: *See—*
Arnott, Robin A.; and Domaracki, John F., 3,972,586.
Domtar Limited: *See—*
Bodycomb, Alistair K., 3,972,482.
Don Fedderson Productions Inc.: *See—*
Casparro, John J., 3,972,140.
Donahue, William J.: *See—*
Czajkowski, Norman; Donahue, William J.; Douglas, James M.; and Cammack, Thomas A., 3,972,290.
Donaldson, Jack D. Anti-load stripping and safety attachment for logging truck-trailer combinations. 3,972,540, Cl. 280-404.000.
Donnelly Mirrors, Inc.: *See—*
Baumgardner, John D.; and Ebeling, Dorothy J., 3,972,596.
Dotzer, Richard; and Iwantscheff, Georg, to Siemens Aktiengesellschaft. Method for pretreating surfaces of electrically conductive materials prior to electroplating. 3,972,784, Cl. 204-14.00N.
Dougherty, Duayne D. Multi-bladed upright for a fence. 3,972,510, Cl. 256-11.000.
Dougherty, Timothy Stephen: *See—*
Cereijo, Manuel Ramon; and Dougherty, Timothy Stephen, 3,973,187.
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Dovey Manufacturing Company: *See—*
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Livak, John E.; and Budde, Paul B., 3,973,039.
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McCarthy, James R., Jr., 3,972,931.
Moore, Charles H., 3,972,220.
Yonkers, Edward H.; and Nagle, Floyd B., 3,972,222.
Doyle, William C., Jr.; and Kirkpatrick, Joel L., to Gulf Oil Corporation. 1-Dimethylcarbamyl-3-branched alkyl-1,2,4-triazol-5-yl-(N-substituted) sulfonamides and use as insecticides. 3,973,028, Cl. 424-269.000.
Drabek, Jozef, to Ciba-Geigy Corporation. Thiolphosphoric acid ester insecticide. 3,973,014, Cl. 424-225.000.
Dreamland Electrical Appliances Limited: *See—*
Rowe, Anthony William, 3,973,257.
Dreger, Geoffrey, to P.L. Robertson Manufacturing Co. Ltd. Punch for making recessed screw. 3,972,083, Cl. 10-7.000.
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Minnicino, Michael Anthony, 3,972,652.
Napora, Nicholas, 3,972,516.
Drews, Hilbert F. P. Vehicle air screen apparatus. 3,972,494, Cl. 244-130.000.
Driscoll, Gary L.; and Haseltine, Marcus W., Jr., to Sun Research and Development Co. Traction drive with a traction fluid containing gem-structured polar organo compound. 3,972,243, Cl. 74-200.000.
Driscoll, Gary L.; and Haseltine, Marcus W., Jr., to Sun Oil Company. Chemical reaction products of polyisobutylene. 3,972,941, Cl. 260-593.00R.
Drobina, Dezso Donald. Multi-rotor electric motor. 3,973,137, Cl. 310-114.000.
Druge, Gerard: *See—*
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Drummond, Warren W., to PPG Industries, Inc. Glass fiber attenuator. 3,972,703, Cl. 65-11.00W.
Duescher, Margie F., to FisHair Incorporated. Method of making a fishing lure component. 3,972,760, Cl. 156-181.000.
Dugan, John M., to Blaw-Knox Foundry & Mill Machinery, Inc. Method of and apparatus for making compound rolls. 3,972,366, Cl. 164-52.000.
Dummen, Paul Ludwig: *See—*
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Dunlop Limited: *See—*
Markham, John Lucien, 3,972,842.
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Du Pont de Nemours, E. I., and Company: *See—*
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Dupont, Roger; Eckert, Konrad; Knapp, Heinrich; and Wessel, Wolf, to Robert Bosch G.m.b.H. Fuel injection system. 3,972,314, Cl. 123-139.0AW.
DuRoss, James Wix, to ICI United States Inc. Sugarless chewing gum having improved shelf life. 3,973,041, Cl. 426-3.000.
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Hagan, James J.; and Glaser, Charles, 3,973,002.
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Earp, James Wiley, Jr. Gutter cleaner. 3,972,552, Cl. 294-19.00R.
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Easwaran, Jairaj; and Foerster, George S., to NL Industries, Inc. Method for the preparation of porous ferrous metal impregnated with magnesium metal. 3,973,061, Cl. 427-319.000.
Eaton Corporation: *See—*
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Breame, Stephen A., 3,972,538.
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Eguchi, Taro: *See—*
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Eisenkopf, Hermann; and Leitz, Ludwig, to Ernst Leitz G.m.b.H. Apparatus for stabilizing a line of sight. 3,972,621, Cl. 356-152.000.
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Jones, Charles D., 3,972,884.
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Marshall, Winston S., 3,972,934.
Molloy, Bryan B., 3,972,935.
Souter, Rex W., 3,972,925.
Elkins, Gene C. Apparatus for cutting a curved edge on a metal strip having surfaces in more than one plane. 3,972,215, Cl. 72-326.000.
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Embree, Milton Luther; and Goldthorp, David Clayton, to Bell Telephone Laboratories, Incorporated. Bias control circuitry for semiconductor bridge. 3,973,143, Cl. 307-255.000.
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Empire Plating Company, The: *See—*
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Engelhard, William E., to Owego Heat Treat, Inc. Method of heat treating ferrous workpieces. 3,972,751, Cl. 148-149.000.
Entzmann, Karl. Process of burning fuel slate to produce energy and cement clinker at the same time. 3,972,724, Cl. 106-103.000.
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Eppensteiner, Frederick W.; and DeChristopher, Phillip J., to Richardson Company, The. Alkaline bright zinc plating and additive composition therefore. 3,972,789, Cl. 204-55.00Y.
Epstein, William H. Footwear construction. 3,972,136, Cl. 36-101.000.
Equipment Development Corporation: *See—*
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Erculiani, Paolo, to Societa Italiana Telecomunicazioni Siemens S.p.A. Transmission line for TDM communication system. 3,973,227, Cl. 333-97.00R.
Ericson, Lars Torsten; Ljungstrom, Lars Gosta; and Widmark, Gustaf Henrik, to Sandvik Aktiebolag. Method of making material for hard facing. 3,972,108, Cl. 29-420.500.
Erkkila, Raymond N.: *See—*
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Ernst, Heini; and Guenin, Albert, to Hoffmann-La Roche Inc. Respirator. 3,972,327, Cl. 128-145.800.
Ernst Leitz G.m.b.H.: *See—*
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Eskeli, Michael. Thermodynamic machine of the vane type. 3,972,194, Cl. 60-650.000.
Eskeli, Michael. Rotary heat exchanger. 3,972,203, Cl. 62-402.000.
Esposito, Angelo. Automatic shut-off device for fluid dispensing faucet. 3,972,377, Cl. 177-117.000.
Estes, Ellis G.: *See—*
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Bushnell, James D., 3,972,802.
Machado, Roberto L.; Eisenberg, Benjamin; and Baumann, George P., 3,972,692.
Fahey, Dennis M., to PPG Industries, Inc. Glass fiber material having strength retention in a moist environment. 3,973,071, Cl. 428-292.000.
Fahrni, Fritz, to Ciba-Geigy AG. Coating device. 3,973,062, Cl. 427-420.000.
Fake, Charles Sylvester, to Beecham Group Limited. Antihypertensive polycyclic compounds for treating hypertension. 3,973,023, Cl. 424-263.000.
Fannin, Wayne V., to General Motors Corporation. Telescoping energy absorber for vehicle bumpers and method of assembly. 3,972,551, Cl. 293-85.000.
Fantigrossi, Frank: *See—*
Chao, Albert; and Fantigrossi, Frank, 3,972,114.
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Farrell Patent Company: *See—*
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Tsygankov, Mikhail Stepanovich; Bitjutskaya, Nina Alexandrovna; Fateeva, Vera Nikonorovna; Kosholkin, Valery Nikolaevich; Karev, Boris Dmitrievich; Kudinov, Nikolai Alexeevich; Kholkin, Mars Mikhailovich; Moiseev, Nikolai Nikiforovich; and Malandin, Oleg Georgievich, 3,972,736.
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Faure, Robert. Band-type polisher. 3,972,152, Cl. 51-141.000.
Fauth, Karl-Heinz: *See—*
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Feess, Erich; and Dethloff, Heinz, to Hoechst Aktiengesellschaft. Process for the preparation of discharge effects on dyeings or prints made with disperse dyes on flat-surface textile structures of synthetic fibers. 3,972,677, Cl. 8-69.000.
Fegley, Charles Robert. Fluid dispensing anti-burglar device. 3,972,447, Cl. 222-5.000.
Fehrer, Ernst. Apparatus for producing spun yarn from textile fibers. 3,972,173, Cl. 57-58.890.
Feit, Peter Werner; Nielsen, Ole Bent Tvaermose; and Bruun, Herta, to Leo Pharmaceutical Products Ltd.; and A/S Lovens Kemiske Fabrik Produktionsakieselskab. Certain 4-phenoxy-3-heteroarylmethyl or ethyl sulfamyl benzoic acid derivatives. 3,972,886, Cl. 260-294.80F.
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Fender, Ferdinand G.; and Karlsson, Tore S., to Ni-Tec, Inc. Oscillator amplitude regulating system. 3,973,220, Cl. 331-109.000.
Fenton, Donald M.; and Vaell, Raoul P., to Union Oil Company of California. Reducing the consumption of anthraquinone disulfonate in Stretford solutions. 3,972,989, Cl. 423-573.00G.

Ferrari, Pier Nello, to Roemmers Sociedad Anonima Industrial, Comercial y Financiera. Analgesic method containing Lysine 2-(2-methyl-3-chloro-anilino)-3-nicotinate. 3,973,027, Cl. 424-266.000.

Ferrin, Charles R.: *See—*
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Ferrington, Leslie Joseph, to Wildt Mellor Bromley Limited. Patterning control arrangements for knitting machines. 3,972,208, Cl. 66-50.00R.

Ferris, Donald Leroy; and Rybicki, Robert Charles, to United Technologies Corporation. Two-position helicopter main rotor. 3,972,491, Cl. 244-17.270.

Ferroni, Bernardo: *See—*
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Fessler, Raymond Roy; Berry, Warren Elmer; Wenk, Russell Lee; and Parkins, Redvers Nicholson, to American Gas Association, Inc. Inhibition of stress-corrosion cracking of steel pipeline. 3,973,056, Cl. 427-136.000.

Feterl, Leon G., to SOS Consolidated, Inc. Load coupler for trailers. 3,972,541, Cl. 280-423.00R.

Fiberwoven Corporation, The: *See—*
Smith, Alexander M., II; Adkins, Allen H.; and Roth, Thomas M., Jr., 3,973,066.

Field, Jesse L., Jr.; and Medina, Glen J., to Caterpillar Tractor Co. Hydraulically actuated detent mechanism. 3,972,264, Cl. 91-358.00A.

Field, Robert G.; and Wahl, Donn A., to GTE Sylvania Incorporated. Digital receiver. 3,973,242, Cl. 340-168.00B.

Fife, Daryl B.: *See—*
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Figueroa, Raymond Oscar: *See—*
Bibsens, Gunars; and Figueroa, Raymond Oscar, 3,973,211.

Fillmann, Werner, to Schloemann-Siemag Aktiengesellschaft. Injection molding apparatus for manufacturing layered articles. 3,972,664, Cl. 425-130.000.

Filter, Harold E.; and Stevens, Don L., to Dow Chemical Company, The. Fire extinguishing composition. 3,972,820, Cl. 252-5.000.

Finke, Manfred; Kleiner, Hans-Jerg; Stahler, Gerhard; and Dehmer, Klaus, to Hoechst Aktiengesellschaft. Process for the preparation of phosphonic acid dihalides. 3,972,923, Cl. 260-543.00P.

Finn, William E., to Lawrence Peska Associates, Inc., a part interest. Foot massaging device. 3,972,322, Cl. 128-57.000.

Firestone Tire & Rubber Company, The: *See—*
Cheng, Tai Chun; Kyker, Gary S.; and Antkowiak, Thomas A., 3,972,841.

Fischer, Robert Louis, to Caterpillar Tractor Co. Grapple unit for logging vehicles. 3,972,431, Cl. 214-147.00G.

FisHair Incorporated: *See—*
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Fisher Scientific Company: *See—*
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Fisher, Sidney T.; and Fisher, Charles B. Exraction of hydrocarbons in situ from underground hydrocarbon deposits. 3,972,372, Cl. 166-248.000.

Fisons Limited: *See—*
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Fite, Wade L.; and Myers, Richard L. Detector for heavy ions following mass analysis. 3,973,121, Cl. 250-292.000.

Flanagan, Charles D., to Texas Instruments Incorporated. Self-limiting electric hair curler heater. 3,973,100, Cl. 219-222.000.

Flash Technology Corporation of America: *See—*
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Fleischer, Helmut, to Robert Bosch G.m.b.H. Vehicle brake anti-block system with selective steering, or braking priority. 3,972,568, Cl. 303-21.00A.

Fleming, Alan J.: *See—*
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Foesco International Limited: *See—*
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Fogg, Walter K. Disposable combination stitch picker and seam ripper. 3,972,117, Cl. 30-287.000.

Fong, Kouan, to General Electric Company. Signal repeater for power line access data system. 3,973,087, Cl. 179-170.00R.

Fong, Kouan, to General Electric Company. Power line access data system. 3,973,240, Cl. 340-151.000.

Fong, William: *See—*
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Fontvieille, Andre. Apparatus for fabricating flat objects. 3,972,766, Cl. 156-358.000.

Fooladi, Mike M., to Vicksburg Chemical Co. Method for cleaning nitrogen oxides from air. 3,972,824, Cl. 252-364.000.

Forberg, Helge Ole: *See—*
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Forseth, Glenn J., to Phillips Petroleum Company. Production of high structure soft carbon black. 3,972,986, Cl. 423-456.000.

Forslund, Erik Torsten, to Osthergs Fabriks AB. Crane jib arrangement. 3,972,430, Cl. 214-147.00G.

Forsythe, Alan K.; and Green, Charles J., to Hazleton Laboratories Corporation. Shear. 3,972,116, Cl. 30-228.000.

Fort, Emil M.; Kaczmsrek, Thomas D.; and Phillips, David C., to Westinghouse Electric Corporation. Sampling system for power generators. 3,972,225, Cl. 73-28.000.

Fortuin, Michael Stanley; and Caunt, Anthony David, to Imperial Chemical Industries Limited. Polymerization process. 3,972,866, Cl. 526-77.000.

Fosberg, Michael Allen; Lancaster, James Wallace; Schroeder, Mark Joseph; and Plunkett, Jerry D., to United States of America, Agriculture. Fuel moisture analog. 3,972,826, Cl. 252-408.000.

Foster, Colin E., to Sanitary Scale Company. Null monitoring system. 3,973,109, Cl. 235-151.330.

Foster, Dean Harold; and Adamoski, William, Jr., to Pitney-Bowes, Inc. Sheet jogging assembly. 3,972,525, Cl. 271-221.000.

Fothergill, Graham Alwyn; Osbond, John Mervyn; and Wickens, James Charles, to Hoffmann-La Roche Inc. 7-Substituted benzofuran derivatives. 3,972,900, Cl. 260-346.20R.

Foxboro Company, The: *See—*
Miller, Richard W.; Felton, Gerald L.; and Petros, Kenneth W., 3,972,232.

Frane, John A.: *See—*
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Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H.: *See—*
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Franzen, Ingemar, to ITT Industries, Inc. Rotary pump. 3,972,643, Cl. 415-146.000.

Frayer, David A. System for determining the amount of liquid in a tank or series of tanks. 3,972,235, Cl. 73-311.000.

Frazier, Larry C., to National-Standard Company. Apparatus for forming a tire breaker. 3,972,767, Cl. 156-397.000.

Freedman, Harold H., to Dow Chemical Company, The. Process for preparing phosphorothioates and phenylphosponothioates. 3,972,887, Cl. 260-294.80K.

Freeman, Alfred B. Touch responsive keyboard apparatus. 3,973,255, Cl. 340-365.00E.

Freeman, Frank George, to Joseph Lucas (Industries) Limited. Radial piston type pumps or motors. 3,972,268, Cl. 91-492.000.

Freeman, Mathew L.: *See—*
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Fricke, Hans; and Schummer, Hans, to Klockner-Humboldt-Deutz Aktiengesellschaft. Gas turbine. 3,972,642, Cl. 415-145.000.

Fricke, Hans-Jurgen: *See—*
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Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
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Frietzsche, Gunther B., to Paul Gillet GmbH. Catalytic converter having pressurized-gas support means. 3,972,687, Cl. 23-288.0FC.

Frohberger, Paul-Ernst: *See—*
Kramer, Wolfgang; Buchel, Karl Heinz; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 3,972,891.

Frohler, Hanns; and Rossberger, Erwin, to Dipl.-Ing. Hanns Frohler KG. Electrolytic apparatus. 3,972,796, Cl. 204-269.000.

Fry, David Philip, to BP Chemicals International Limited. Moulding process for unsaturated polyester resins containing filler material. 3,972,977, Cl. 264-331.000.

Fryklund, Gilbert G.: *See—*
Levy, Kenneth; Corbin, David; Fleming, Alan J.; Friedman, David; Fryklund, Gilbert G.; Parker, Vance; and Schliemann, Gerd, 3,972,424.

Fuji Photo Film Co., Ltd.: *See—*
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Fuji Photo Optical Co., Ltd.: *See—*
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Fujino, Masahiko; Shinagawa, Susumu; and Fukuda, Tsunehiko, to Takeda Chemical Industries, Ltd. Novel decapeptide amide analogs of leuteinizing hormone-releasing hormone. 3,972,859, Cl. 260-112.5LH.

Fujita, Fumio: *See—*
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Fujitsu Ltd.: *See—*
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Fukinuki, Takahiko; and Eto, Yoshizumi, to Hitachi, Ltd.; and Hitachi Electronics, Ltd. Two-level picture signal transmission system. 3,973,079, Cl. 178-6.000.

Fukuda, Tsunehiko: *See—*
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Fukuda, Yoshio: *See—*
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Fukushima, Seitaro; Kawahara, Kiyoshi; and Sugawara, Yukio, to Mitsubishi Kinzoku Kabushiki Kaisha. Method for recovering chlorine from chlorine-containing gaseous mixtures containing carbon dioxide as one component. 3,972,691, Cl. 55-23.000.

Fuller Company: *See—*
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Fuller, Kenneth J. Device for securing and storing paired socks. 3,972,094, Cl. 24-150.0SP.

Funabashi, Hiroyasu: *See—*
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Funayama, Yoshiaki, to Nihon Zemu Co., Ltd. Laser reference device. 3,972,623, Cl. 356-172.000.

Furbeck, Warren R.: *See—*
Lee, Charles A.; Furbeck, Warren R.; and Kemp, Horace N., 3,972,488.

Furda, Ivan; and Malizia, Peter Donato, to General Foods Corporation. Method of mixing flavors and fixed composition comprising derivatized synthetic polysaccharides. 3,973,049, Cl. 426-533.000.

Furuya, Tsutomu: *See—*
Yamada, Masaru; Furuya, Tsutomu; Izumi, Chikashi; Narita, Shigeyoshi; and Ishikawa, Hiroshi, 3,972,777.

G. D. Searle & Co.: *See—*
Baran, John S.; and Liang, Chi-Dean, 3,972,907.
Karim, Aziz; Marsheck, William J.; and Weier, Richard M., 3,972,871.

G. D. Societa per Azioni: *See—*
Seragnoli, Enzo, 3,972,271.
Seragnoli, Enzo, 3,972,408.

GAF Corporation: *See—*
Smith, Richard F., 3,972,875.

Gail, Josef, to Maschinenfabrik Fahr Aktiengesellschaft. Sensor arrangement for harvester of stalk-type row crop. 3,972,381, Cl. 180-79.100.

Gallagher, John J. Lightweight end connectors for pollution containment boom. 3,972,197, Cl. 61-1.00F.

Gallagher, Robert George, to Energy Systems, Inc. Solar fluid heater. 3,972,317, Cl. 126-271.000.

Galusky, Thom B.; and Ilagan, Juan B., Jr., to SCM Corporation. Process for tempering beaded fat quickly. 3,973,053, Cl. 426-601.000.

Gambill, Charles C., to General Motors Corporation. Electronic internal combustion engine ignition spark vacuum and speed advance system. 3,972,310, Cl. 123-117.00R.

Gardner, Homer K., Jr.; Hron, Robert J., Sr.; Vix, Henry L. E.; and Ridlehuber, Jim M., to United States of America, Agriculture. Process for producing an edible cottonseed protein concentrate. 3,972,861, Cl. 260-123.500.

Gardner, John, to Trans-Comm Mfg. Inc. Portable electronic system for use with a direct current source having a ground of either positive or negative polarity. 3,973,202, Cl. 325-313.000.

Garrett Corporation, The: *See—*
Albright, Charles F., 3,972,945.

Garwood, William E.; Jacob, Solomon M.; Kuo, James C.; and Wise, John J., to Mobil Oil Corporation. Conversion of coal to high octane gasoline. 3,972,958, Cl. 260-683.490.

Gassman, Paul G., to Ohio State University Research Foundation, The. Synthesis of oxindoles from anilines and β-thio carboxylic esters or amides. 3,972,894, Cl. 260-325.00R.

Gates Rubber Company, The: *See—*
Hammel, Ronald O., 3,972,739.

Gaule, Gerhart K.; and Laplante, Paul, to United States of America, Army. Tandem configuration for EMP protection. 3,973,224, Cl. 333-12.000.

Gebruder Netzsch, Maschinenfabrik: *See—*
Henkel, Ernst August Wilhelm, 3,972,670.

Geenen, Constant Joseph Maria; and Schuil, Roelof Egbert, to U.S. Philips Corporation. Color screen with space between luminescent regions pervious to thermal radiation from shadow mask. 3,973,160, Cl. 313-408.000.

Geiger, Julius: *See—*
Klein, Hans Joachim; Rupprecht, Manfred; Wonneberg, Heinz; and Geiger, Julius, 3,972,624.

Geisler, Francis E. Fishing rod and reel case. 3,972,144, Cl. 43-26.000.

Gelber, Robert M., to Optical Coating Laboratory, Inc. Display device which changes color and method. 3,972,590, Cl. 350-160.0LC.

General Atomic Company: *See—*
Bokros, Jack C., 3,972,818.
Stevens, Dennis Wakefield, 3,972,619.

General Electric Company: *See—*
Anthony, Thomas R.; and Cline, Harvey E., 3,972,741.
Beak, John H.; and Speer, Gordon W., 3,973,185.
Boughton, Stephen G.; and Wilkerson, James D., Jr., 3,972,550.
Ciarcia, Ronald David; and McGann, James Edward, Jr., 3,973,230.
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Gessler, Albert M.: *See—*
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Ghiglione, Jean-Pierre Maurice: *See—*
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Giddey, Claude; and Rufer, Willy, to Battelle Development Corporation. Proteinaceous food product. 3,973,044, Cl. 426-104.000.

Gierth, Volker: *See—*
Mueller-Tamm, Heinz; Buechner, Oskar; Gierth, Volker; and Fauth, Karl-Heinz, 3,973,060.

Gigliotti, Michael F. X., Jr.; and Greskovich, Charles D., to General Electric Company. Process for forming a barrier layer on ceramic molds suitable for use for high temperature eutectic superalloy casting. 3,972,367, Cl. 164-72.000.

Giorgi, Tiziano A.; and della Porta, Paolo, to S.A.E.S. Getters S.p.A. Charged-particle trapping electrode. 3,973,157, Cl. 313-353.000.

Girling Limited: *See—*
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Gits Brothers Manufacturing Co.: *See—*
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Giuliani, Raymond E.: *See—*
Dollar, David L.; Giuliani, Raymond E.; Mirra, Michael J.; and Headrick, Jon W., 3,972,743.

Giulie, Joe D., to Minnesota Mining and Manufacturing Company. Cut-off device for binding machine. 3,972,085, Cl. 11-1.0MB.

Glaser, Charles: *See—*
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Glasser, Alfredo: *See—*
Arcari, Giuliana; Bernardi, Luigi; Bosisio, Germano; Glasser, Alfredo; and Sinatra, Innocenzio, 3,972,883.

Glaverbel-Mecaniver: *See—*
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Gleockler, Frederick M.; and Gleockler, Robert G. Air cleaner for tractor engine. 3,972,700, Cl. 55-385.00B.

Gleockler, Robert G.: *See—*
Gleockler, Frederick M.; and Gleockler, Robert G., 3,972,700.

Glinkin, Vladimir Pavlovich: *See—*
Kraizinger, Fedor Vladimirovich; Pogoretsky, Vitaly Vasilievich; Tarpinian, Dmitry Apelovich; Popov, Valery Petrovich; Perimov, Alexandr Alexeevich; and Glinkin, Vladimir Pavlovich, 3,972,517.

Goens, Duane N.; and Kruesi, Paul R., to Cyprus Metallurgical Processes Corporation. Cuprous chloride recovery process. 3,972,711, Cl. 75-117.000.

Goens, Duane N.; and Lake, James L., to Hazen Research, Inc. Axial flow electrolytic cell. 3,972,795, Cl. 204-269.000.

Goldberg, Arthur E., to Ixcon Inc. Measuring apparatus. 3,973,122, Cl. 250-338.000.

Goldsamt, Alan B. Electronic calculator for feet-inch-fraction numerics. 3,973,113, Cl. 235-156.000.

Goldthorp, David Clayton, to Bell Telephone Laboratories, Incorporated. Transistor driver circuit. 3,973,141, Cl. 307-255.000.

Goldthorp, David Clayton: *See—*
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Goloff, Alexander; and Barker, Noble G., to Caterpillar Tractor Co. Housing for slant axis rotary mechanism. 3,972,658, Cl. 418-53.000.

Goodyear Aerospace Corporation: *See—*
Lovich, John W.; Meller, Oscar W.; and Morse, Frank C., 3,972,437.

Gorman, Thomas E.; and Raley, Frederick O., to United Technologies Corporation. Adjustable lathe template. 3,972,251, Cl. 82-14.00R.

Gorring, Robert L.; Scott, Eric J. Y.; and Smith, Robert L., to Mobil Oil Corporation. Process for stabilizing lubricating oil with elemental sulfur. 3,972,853, Cl. 252-45.000.

Goschke, Richard, to Ciba-Geigy Corporation. Quinolineacetic acid compositions. 3,973,022, Cl. 424-258.000.

Goshima, Yoshitomo: *See—*
Komori, Shigehiro; Goshima, Yoshitomo; Katayama, Hajime; and Miyamoto, Koichi, 3,972,612.

Gottesman, Roy T.; Kagan, George M.; and Fath, Joseph, to Tenneco Chemicals, Inc. Loss-of-dry inhibitors for surface-coating compositions. 3,972,825, Cl. 252-382.000.

Gouye, Emmanuel V.; and Radaci, Gerald S., to Koppers Company, Inc. Scraper for the lid and lid seat of a coke oven ascension pipe. 3,972,781, Cl. 202-241.000.

Grabb, Frederick G., to Bendix Corporation, The. Balanced servomotor valve. 3,972,191, Cl. 60-553.000.

Grabick, Helen, executrix: *See—*
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Grabowski, Edward J. J.: *See—*
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Graff, Roderich W. Apparaus for the adsorption treatment of a gaseous medium. 3,972,129, Cl. 34-32.000.

Grange, Howard L. Roof construction with inlet and outlet venting means. 3,972,164, Cl. 52-95.000.

Grant, Frederic F., to Technicolor Corporation. Endless-roll film cartridge. 3,972,485, Cl. 242-55.19A.

Graphic Sciences, Inc.: *See—*
Costello, Matthew J.; Dolan, Donald T.; Debaudringhien, Andre T.; Hurkmans, Antoon M.; Jasinski, Kenneth R.; and Keplinger, Edward G., 3,973,264.

Grau, Hermann. Safety closure cap. 3,972,436, Cl. 215-220.000.

Graziadei, Rinaldo; and Siligoni, Marco, to SGS-ATES Componenti Elettronici S.p.A. Voltage boosting detector circuit. 3,973,180, Cl. 321-15.000.

Green, Charles J.: *See—*
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Green, Gary L.: *See—*
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Green, Gary Warner, to United Technologies Corporation. Sound absorption with variable acoustic resistance means by oscillatory air pressure signal. 3,972,383, Cl. 181-33.0HC.

Green, Terence C., to United States of America, Navy. Sensitivity improvement of spaced-loop antenna by capacitive gap loading. 3,973,263, Cl. 343-744.000.

Greenbaum, Sheldon B.: *See—*
Horn, Herman; Greenbaum, Sheldon B.; Ely, Charles M.; Hacke, Walter; and Olle, David A., 3,973,021.

Greene, Ted R. Intrusion detector sensitive to resonant frequency of breaking glass. 3,973,095, Cl. 200-61.930.

Gregoli, Armand A., to Cities Service Research & Development Co. Oil shale retorting. 3,972,801, Cl. 208-11.00R.

Greig, Margaret E., to Upjohn Company, The. Hydratropic acid derivatives in the treatment of non-inflammatory allergic reactions. 3,973,037, Cl. 424-317.000.

Grelecki, Chester: *See—*
Naporano, Joseph F.; Baker, Benjamin A.; Tunkel, Steven J.; Grelecki, Chester; and Van Houten, George L., 3,972,481.

Greskovich, Charles D.: *See—*
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Gresl, Charles, Jr., to Becton, Dickinson and Company. Blood serum separation filter disc. 3,972,812, Cl. 210-77.000.

Grewe, Ferdinand: *See—*
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Griffith, Leonard: *See—*
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Grimaldi, Pierre: *See—*
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Grise, Frederick G. J.; and Lovell, Walter. Mixing materials in containers. 3,972,512, Cl. 259-102.000.

Groelz, Jay C., to Heinzman Engineering, Inc. (Entire). Hydraulic actuated load sensing governor, 3,972,478, Cl. 239-189.000.

Gross, Frank C., to A. B. Dick/Scott. Electrophotographic apparatus for production of plural images on a sheet. 3,972,610, Cl. 355-7.000.

Gross, James Richard, to Dow Chemical Company, The. Molecular weight control in charge-transfer copolymerization. 3,972,903, Cl. 260-346.80R.

Groupement pour les Activities Atomiques et Avencees "GAAA": *See—*
Carbonnel, Henri, 3,972,369.

Grove, Marvin H., to M & J Valve Company. Valve construction. 3,972,507, Cl. 251-172.000.

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Grover, John L.; and Power, Wilson H., to Monsanto Company. Method for printing interlayers for laminated safety glass. 3,973,058, Cl. 427-163.000.

Grundstrom, Erik Hilding; Grundstrom, Gote Einar; and Waleij, Ivar. Planting machine. 3,972,294, Cl. 111-3.000.

Grundstrom, Gote Einar: *See—*
Grundstrom, Erik Hilding; Grundstrom, Gote Einar; and Waleij, Ivar, 3,972,294.

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Guile, Roy N.: *See—*
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Gulf Oil Corporation: *See—*
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Gulf Research & Development Company: *See—*
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Gunther, Dieter: *See—*
von der Eltz, Hans-Ulrich; Gunther, Dieter; Krell, Karl-Heinz; Matterstock, Karl; and Vollmann, Hansjorg, 3,972,904.

Gustafsson, Gustaf Erik. Seatback tilt adjustment mechanism. 3,972,563, Cl. 297-362.000.

Guth, Charles D.: *See—*
Scott, William W., Jr.; and Guth, Charles D., 3,973,076.

Gutierrez, William A.; and Wilson, Herbert L., to United States of America, Army. Electron emitter and method of fabrication. 3,972,750, Cl. 148-171.000.

H. Kohnstamm & Company: *See—*
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H. O. Trerice Co.: *See—*
Andrews, Richard A., 3,973,265.

Haak, Willard J.; Marsden, Howard A.; and Sturges, James R., to Caterpillar Tractor Co. Overruning load control for hydraulic jacks. 3,972,267, Cl. 91-445.000.

Haas, Georges; and Sallmann, Alfred, to Ciba-Geigy Corporation. Analgesic and anti-inflammatory anilino-phenylacetic acid-(2,3 or 4 pyridyl)-methyl esters and derivatives. 3,973,024, Cl. 424-263.000.

Haas, Werner E. L.: *See—*
Adams, James E.; Dir, Gary A.; and Haas, Werner E. L., 3,972,588.

Habault, Robert: *See—*
Barbe, Gerard; Habault, Robert; and Tamet, Jean-Louis, 3,973,073.

Habegger, Harold. Thread-rolling head. 3,972,213, Cl. 72-104.000.

Haberle, Norman: *See—*
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Hachinohe Smelting Co., Ltd.: *See—*
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Hacke, Walter: *See—*
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Hagan, James J.; and Glaser, Charles, to E. R. Squibb & Sons, Inc. Antihemophilic factor. 3,973,002, Cl. 424-101.000.

Hagar, Donald K., to Mosser Industries, Inc. Temperature compensating valve assembly. 3,972,348, Cl. 137-601.000.

Hage, Stanislas. Filtering apparatus. 3,972,699, Cl. 55-283.000.

Hagen, Siegfried Hendrik; van Osenbruggen, Cornelis; Anton, Herman; Reemers, Joseph; and Verspui, Gerrit, to U.S. Philips Corporation. Electrode for electrochemical machining. 3,972,797, Cl. 204-290.00R.

Hager, Hans Jacob: *See—*
Cleeland, Roy, Jr.; and Hager, Hans Jacob, 3,972,992.

Haizinger, Ferdinand, to Koflach Sportgerate Ges. m.b.H. Process for connecting a shoe sole to its shaft. 3,972,087, Cl. 12-145.000.

Halcour, Kurt; Losacker, Paul; Schwerdtel, Wulf; and Swodenk, Wolfgang, to Bayer Aktiengesellschaft. Process for preparation of isoprene. 3,972,955, Cl. 260-681.000.

Hall, Charles M.: *See—*
Wright, John B.; and Hall, Charles M., 3,972,911.

Hall, David A.; Berry, Donnis M.; and Landis, Paul W., to Eli Lilly and Company. Continuous flow-through mercury cathode electrolysis cell. 3,972,793, Cl. 204-219.000.

Hall, Mark G. Mobile fluid sprayer system. 3,972,476, Cl. 239-167.000.

Halliburton Company: *See—*
Brown, Claude H., 3,972,285.

Hamada, Shotaro. Paper holder. 3,972,458, Cl. 225-20.000.

Hamanaka, Ernest S., to Pfizer Inc. 6-[α-(ω-Guanidinoalkanoylamido)acylamido]penicillanic acids. 3,972,872, Cl. 260-239.100.

Hamill, Robert L.; Higgens, Calvin E.; and Hoehn, Marvin M., to Eli Lilly and Company. Antibiotic A16884. 3,973,015, Cl. 424-246.000.

Hamilton, Joel A.: *See—*
Mahaffy, Reid A.; and Hamilton, Joel A., 3,972,155.

Hamilton, Wilson S.; Katsumato, Malcolm T.; Lea, James M.; and Trepus, George E., to Boeing Company, The. Hydrophobic windshield wipers and process for making same. 3,972,850, Cl. 260-37.0SB.

Hammann, Ingeborg: *See*—
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Hammel, Joseph J.; and Allersma, Ties, to PPG Industries, Inc. Phase separatable borosilicate glass compositions. 3,972,720, Cl. 106-54.000.

Hammel, Joseph J.; and Allersma, Ties, to PPG Industries, Inc. Thermally stable and crush resistant microporous glass catalyst supports and methods of making. 3,972,721, Cl. 106-40.00V.

Hammel, Ronald O., to Gates Rubber Company, The. Rechargeable battery with current limiting means. 3,972,739, Cl. 136-181.000.

Hammer, Clarence Frederick; and Sinclair, Harold King, to Du Pont de Nemours, E. I., and Company. Process for the preparation of graft copolymers. 3,972,961, Cl. 260-857.00G.

Hammerstrom, Knut: *See*—
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Hammond, Peter R.: *See*—
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Hananoi, Toshihiro: *See*—
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Hanaoka, Masanori. Catalyst converter. 3,972,685, Cl. 23-288.0FC.

Handschuch, Karl; and Niestroj, Heinrich, to Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Housing construction for open end spinning machines. 3,972,171, Cl. 57-58.890.

Hannah, Bruce R.: *See*—
Morrison, Andrew I.; and Hannah, Bruce R., 3,972,098.

Hans Sickinger Co.: *See*—
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Hansen, Kenneth N., to Allis-Chalmers Corporation. Multiple lever control console. 3,972,249, Cl. 74-526.000.

Hanson, Richard Eric; and Fordyce, William Fulmer, to RCA Corporation. Detecting malfunction in cylinders of internal combustion engines. 3,972,230, Cl. 73-116.000.

Hanusa, Helmut G., to Textron, Inc. Apparatus for continuously producing foamed material. 3,972,667, Cl. 425-224.000.

Hara, Bungo: *See*—
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Hargroves, Robert Arthur: *See*—
Jones, Kenneth James; and Hargroves, Robert Arthur, 3,973,115.

Harken, Russel D.; and Morgan, F. Wyman, to Monsanto Company. Process for preparing ether tricarboxylates. 3,972,922, Cl. 260-535.00P.

Harner, Kermit I.; Hixson, William W.; Spadafora, Michael A.; and Stearns, Charles F., to United Technologies Corporation. Compressor bleed sensor and control for turbine type power plants. 3,972,641, Cl. 415-28.000.

Harper, Douglas Charles; Robinson, Norman; and Janikowski, Stanislaw Maria, to Fisons Limited. Method of preventing gypsum scale formation in phosphoric acid plant filters. 3,972,981, Cl. 423-320.000.

Harrell, Danny Hugh. Crop drying apparatus. 3,972,674, Cl. 432-500.000.

Harrington, Joseph Kenneth: *See*—
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Harris Corporation: *See*—
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Harris, Louis Selig; Pars, Harry George; Razdan, Raj Kumar; and Sheehan, John Clark, to Sharps Associates. Morpholine containing esters of thienobenzopyrans and thiopyranobenzopyrans. 3,972,880, Cl. 260-247.10P.

Harris, Ralph E., to Dana Corporation. Piston ring forming method. 3,973,098, Cl. 219-153.000.

Harrison, Charles W., to Texaco Inc. Means for controlling dewaxing apparatus. 3,972,779, Cl. 196-14.500.

Harrison, Thomas S., to Sterling Drug Inc. Spray and evaporative air freshener combination. 3,972,473, Cl. 239-34.000.

Hart, Bernard Eaton. Guns for forming jets of particulate material. 3,972,150, Cl. 51-11.000.

Hart, Robert J., to Commercial Resins Company. End blaster for pipes. 3,972,149, Cl. 51-8.00R.

Hasegawa, Masashi: *See*—
Yamashita, Mitsuo; Mikogami, Akio; Hasegawa, Masashi; and Oizumi, Hiroshi, 3,972,838.

Hasegawa, Toru: *See*—
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Haselwood, Donald E.; Solar, Carl M.; and Thumm, Jeffrey R., to A. C. Nielsen Company. Monitoring system for voltage tunable receivers and converters utilizing an analog function generator. 3,973,206, Cl. 325-455.000.

Hashimoto, Shintaro: *See*—
Washizuka, Isamu; Hashimoto, Shintaro; and Matsui, Hirotoshi, 3,973,111.

Hashimoto, Teiji; Matsumoto, Seiichi; Taguchi, Tetsuya; Kiyohara, Takehiko; and Tsunekawa, Tokuichi, to Canon Kabushiki Kaisha. Exposure control apparatus for a camera. 3,973,267, Cl. 354-43.000.

Hasselbeck, Richard J.; and Wills, Kurt H., to Stolle Corporation, The. Can body trimmer. 3,972,299, Cl. 113-7.00R.

Hausknecht, Louis A. Motor speed control device. 3,973,177, Cl. 318-330.000.

Hausler, Rudolf H., to UOP Inc. Electrochemical cell. 3,972,732, Cl. 136-86.00D.

Hawes, Roland C., to UTI-Spectrotherm Corporation. Interferometer for testing materials of different sizes. 3,972,618, Cl. 356-106.00R.

Hayashi, Torahiko. Transfer device and method. 3,972,409, Cl. 198-31.0AC.

Hayashi, Toshihiko: *See*—
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Hayashi, Yoshiyuki; and Morita, Hideo, to Amada Company Limited. Multiple tool holding punching apparatus. 3,972,260, Cl. 83-549.000.

Hayashibara Biochemical Laboratories, Incorporated: *See*—
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Hayashibara, Ken; and Sugimoto, Kaname, to Hayashibara Company. Containing lactitol as a sweetener. 3,973,050, Cl. 426-552.000.

Hayes, John C. Electric light tester and unit operating device. 3,973,193, Cl. 324-51.000.

Hays, Lance G.; and Elliott, David G., to Biphase Engines, Inc. Two-phase engine. 3,972,195, Cl. 60-671.000.

Hayslip, Raymond W. E., to Lawrence Peska Associates, Inc., a part interest. Rescue apparatus. 3,972,386, Cl. 182-50.000.

Hazen Research, Inc.: *See*—
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Head, Brian Arthur, to Whatman Reeve Angel Limited. Filter tube. 3,972,694, Cl. 55-97.000.

Headrick, Jon W.: *See*—
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Heath, Darrell R.; and Wirth, Joseph G., to General Electric Company. 4,4'-Isopropylidene-bis(3- and 4-phenyleneoxyphthalic anhydride). 3,972,902, Cl. 260-346.300.

Heinzman Engineering, Inc. (Entire): *See*—
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Heitmann, Hans-Gunter, to Kraftwerk Union Aktiengesellschaft. Steam power plant for nuclear reactor stations having pressurized water reactors. 3,972,772, Cl. 176-37.000.

Heligren, Gosta; and Wahlsten, Gunnar. Device for indicating changes in the position of an object. 3,973,259, Cl. 343-7.500.

Hellsten, Karl Martin Edvin: *See*—
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Hengartner, Urs Oskar; and Wehrli, Pius Anton, to Hoffmann-La Roche Inc. Process for the preparation of 6,6-alkylenedioxyalkan-2-ones. 3,972,898, Cl. 260-340.900.

Henkel, Ernst August Wilhelm, to Gebruder Netzsch, Maschinenfabrik. Press for making castings of powder or granular materials. 3,972,670, Cl. 425-355.000.

Henkel, Richard. Vertical conveyor. 3,972,412, Cl. 198-138.000.

Henkes, John L., Jr.: *See*—
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Henkin, Melvyn Lane; and Laby, Jordan Myron. Automatic swimming pool cleaner. 3,972,339, Cl. 134-168.00R.

Henneberg, Wolfgang: *See*—
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Hermes Precisa International S.A.: *See*—
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Herzner, Hans. Rotary piston engine. 3,972,661, Cl. 418-262.000.

Hester, Thomas Eugene, to Litton Systems, Inc. Power supply for a microwave magnetron. 3,973,165, Cl. 315-105.000.

Hewlett-Packard Company: *See*—
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Hill, Donald Gifford, to Bell Telephone Laboratories, Incorporated. Switch turn off circuitry for semiconductor bridge. 3,973,142, Cl. 307-255.000.

Hill, Harvey J., to Roberts Consolidated Industries, Inc. Carpet seaming tape, electric iron therefor. 3,972,768, Cl. 156-545.000.

Hill, Joseph Henry, to Vandervell Products Limited. Flanged half bearings. 3,972,576, Cl. 308-237.00R.

Hill, Robert D., to United States of America, Navy. Determination of semi opaque plasma temperatures. 3,972,615, Cl. 356-45.000.

Hill, Willliam N.: *See—*
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Hiller, Carl D., to Bethlehem Steel Corporation. Method of providing wire strand from a strand production facility. 3,972,175, Cl. 57-145.000.

Himeno, Kiyoshi: *See—*
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Hines, Marion E., to United States of America, Army. Feather-edge phase shifter. 3,973,225, Cl. 333-24.100.

Hino, Masanori; Eguchi, Taro; and Shiraga, Chitoshi, to Onkyo Kabushiki Kaisha. Horn speaker. 3,972,385, Cl. 181-192.000.

Hirano, Masachika; Matsuo, Takashi; Takeda, Hisami; and Nishioka, Toshio, to Sumitomo Chemical Company, Limited. Cyclopropanecarboxylic acid esters. 3,973,036, Cl. 424-304.000.

Hirata, Toshinori: *See—*
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Hoffman, Gordon H.; Nozemack, Richard J.; and Elliott, Curtis Homer, Jr., to W. R. Grace & Co. Fluid cracking catalyst based on silica sol matrix. 3,972,835, Cl. 252-455.00Z.

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Hogan, James A., to Honeywell Inc. Intrinsic safety barrier. 3,973,170, Cl. 317-16.000.

Hogg, Walter R., to Coulter Electronics, Inc. Pulse storing and retrieval circuit. 3,973,108, Cl. 235-92.0PC.

Hogg, Walter R., to Coulter Electronics, Inc. Method and apparatus for ejecting a metered amount of particulate sample. 3,973,196, Cl. 324-71.0CP.

Hohn, Alfred, to BBC Brown Boveri & Company Limited. Method and apparatus for modifying vibrational behavior of a rotary shaft. 3,972,572, Cl. 308-73.000.

Hokkaido Sugar Co., Ltd.: *See—*
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Holden, Thomas W. Electrical wave filter. 3,973,210, Cl. 328-167.000.

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Honnorat, Yves; Pineau, Andre; and Cozar, Ricardo, to Creusot-Loire. Alloys having a nickel-iron-chromium base for structural hardening by thermal treatment. 3,972,752, Cl. 148-162.000.

Hooton, Norris A.: *See—*
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Horn, Herman; Greenbaum, Sheldon B.; Ely, Charles M.; Hacke, Walter; and Olle, David A., to Diamond Shamrock Corporation. 2-[2-(5-Nitro-2-furyl)vinyl]-4-(phydroxyanilino)quinazoline as a bactericide. 3,973,021, Cl. 424-251.000.

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Houdaille Industries, Inc.: *See—*
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Houriez, Gerard P. A. J.; and Van Wuytswinkfl, Charles M. G., to Caterpillar Tractor Co. Swing lock means for an hydraulic excavator. 3,972,378, Cl. 180-6.580.

Hovland, Per Jorgen. Electric impulse transmitters for telephone instruments. 3,973,084, Cl. 179-90.00K.

Howarth, Eric, to H. Kohnstamm & Company. Soap compositions for non-gelling soap solution. 3,972,823, Cl. 252-132.000.

Howell, Edward Keith, to General Electric Company. Ground fault circuit interrupting device with grounded neutral detection. 3,973,171, Cl. 317-18.00D.

Howells, Norman B., to Caterpillar Tractor Co. Friction disc for clutches and the like. 3,972,400, Cl. 192-107.00R.

Hron, Robert J., Sr.: *See—*
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Hudson, Perley N.; and Toby, William R. Vehicle with regenerative power system. 3,972,380, Cl. 180-65.00R.

Hudson, Thomas A.; and Strickland, Gordon E., Jr., to Chevron Research Company. Low adhesional arctic offshore platform. 3,972,199, Cl. 61-103.000.

Hudston, Michael R.; and Levington, Henry J., to Clayton Dewandre Company Limited. Hydraulic cab-tilting systems. 3,972,557, Cl. 296-35.00R.

Huff, Larry Dean, to RCA Corporation. Signal pickup lifting/lowering apparatus. 3,972,533, Cl. 274-23.00R.

Hughes, Richard Swart; Bottka, Nicholas; and Hammond, Peter R., to United States of America, Navy. Laser with a high frequency rate of modulation. 3,973,216, Cl. 331-94.50M.

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Hunt, Bill. In-circuit semiconductor tester. 3,973,198, Cl. 324-158.00D.
Hunt, Roy C., to Standard Oil Company. Hydraulic wrench. 3,972,242, Cl. 74-30.000.
Hunter, John K. Top turn ratchet. 3,972,252, Cl. 81-57.290.
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Ingram, Woodrow Hayes, II, to Monsanto Company. Anti-migratory additive for emulsified phenolic resin systems. 3,973,070, Cl. 428-220.000.
Inns, H. D. E., to Precision-Cosmet Company, Inc. Auxiliary lens holder device for use with a keratometer. 3,972,602, Cl. 351-6.000.
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Ito, Fukusaburo, to Sharp Kabushiki Kaisha. Coil shaped developing electrode for a copying machine. 3,972,306, Cl. 118-637.000.
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Harper, Douglas Charles; Robinson, Norman; and Janikowski, Stanislaw Maria, 3,972,981.
Jannasch, Norman E.; and Hooton, Norris A., to Bendix Corporation, The. Oxidation inhibiting caps for carbon friction disc. 3,972,395, Cl. 188-251.00A.
Jasinski, Kenneth R.: *See—*
Costello, Matthew J.; Dolan, Donald T.; Debaudringhien, Andre T.; Hurkmans, Antoon M.; Jasinski, Kenneth R.; and Keplinger, Edward G., 3,973,264.
Jaybee Manufacturing Corporation: *See—*
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Jefferson Chemical Company, Inc.: *See—*
Laemmle, George Joseph; and Rightmer, Kenneth Carol, 3,972,948.
Jennings, Lewis F., to Uarco Incorporated. Removable imprinter with latch for burster. 3,972,283, Cl. 101-226.000.
Jessee, James M., to Bertea Corporation. Control system with actuator powered by dual sources. 3,972,188, Cl. 60-443.000.
Jett, William B., Jr., to Motorola, Inc. Voltage controlled crystal oscillator apparatus. 3,973,221, Cl. 331-116.00R.
Jockel, Heinz: *See—*
Cornelius, Gerhard; Jockel, Heinz; and Kupfer, Hans, 3,972,688.
Johansen, Ebbe; and Lundsgaard, Finn Chresten, to Radiometer A/S. Method and apparatus for measuring one or more constituents of a blood sample. 3,972,614, Cl. 356-36.000.

John Wyeth & Brother Limited: *See*—
Tipton, Peter William, 3,972,423.
Ward, Terence James, 3,973,025.

Johnson, Axel R.: *See*—
Wolk, Ronald H.; Johnson, Axel R.; and Nongbri, Govanon, 3,972,803.

Johnson, J. Algot; and Kennedy, Robert. Apparatus for a cargo restraint system. 3,972,500, Cl. 248-485.000.

Johnson, James A.; and Wesler, Hugh R., to Universal Oil Products Company. Device for loading catalyst particles into a reaction zone. 3,972,686, Cl. 23-288.00R.

Johnson & Johnson: *See*—
Boricheski, Joseph H., deceased, 3,972,323.

Johnson, Lowell E.: *See*—
Audiffred, Sidney J.; Bump, David W.; Erkkila, Raymond N.; Johnson, Lowell E.; and Pearce, Shairyl I., 3,972,401.

Johnson Matthey & Co., Limited: *See*—
Acres, Gary James Keith; Cooper, Barry John; Diwell, Alan Francis; and Evans, William David James, 3,972,837.

Johnson, Norman Allen. Fail-safe clamping apparatus. 3,972,392, Cl. 188-43.000.

Johnson, Roger W., to Caterpillar Tractor Co. Vane control arrangement for variable area turbine nozzle. 3,972,644, Cl. 415-163.000.

Johnson, Walter W.: *See*—
Calabrese, Richard A.; Estes, Ellis G.; Hopkins, Dean F.; and Johnson, Walter W., 3,972,479.

Johnson, William. Peripheral vision non-distorting rear view mirror. 3,972,601, Cl. 350-303.000.

Johnston, Clifford V., to Cardinal Industries Incorporated. Collapsible lift frame having means to adjust point of lift. 3,972,553, Cl. 294-67.0DA.

Jolly, Ramesh C.: *See*—
Kosikowski, Frank V.; and Jolly, Ramesh C., 3,973,042.

Jones, Charles D., to Eli Lilly and Company. D-homo-aza-steroids. 3,972,884, Cl. 260-287.0AZ.

Jones, Kenneth James; and Hargroves, Robert Arthur, to Lucas Electrical Company Limited, The. Vehicle lamp unit. 3,973,115, Cl. 240-41.35C.

Jonville, Pierre: *See*—
Mosetti, Jacques; Beccu, Klaus D.; and Jonville, Pierre, 3,972,729.

Jorns Mekan AB: *See*—
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Joseph Lucas (Industries) Limited: *See*—
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Rabl, Carl-Roland; Rigler, Rudolf; Jovin, Thomas J.; Brundl, Hermann; and Simm, Wolfgang, 3,972,627.

Jurd, Leonard, to United States of America, Agriculture. Certain cinnamyl phenols as growth inhibitors for mosquito larvae. 3,973,040, Cl. 424-346.000.

Jurd, Leonard: *See*—
Stevens, Kenneth L.; and Jurd, Leonard, 3,972,897.

Justi, Eduard Wilhelm Leonhard; Ewe, Henning; and Brennecke, Peter Wilhelm Reinhard, to Telefonaktiebolaget L M Ericsson. Device for providing an early detection of products of combustion of a polyvinyl chloride substance. 3,973,192, Cl. 324-65.00R.

Jutte, Gottfried W.: *See*—
Sullivan, Robert D.; and Jutte, Gottfried W., 3,972,737.

Jutte, Werner. Method of peristaltic pumping and device for working by such method. 3,972,649, Cl. 417-53.000.

Juzhakov, Nikolai Alexandrovich: *See*—
Petrov, Gennady Nikolaevich; Tolstopyatov, Gennady Mikhailovich; Krasilnikov, Sergei Mikhailovich; Juzhakov, Nikolai Alexandrovich; Kornilova, Tatyana Alexeevna; Lashova, Svetlana Mikhailovna; Shatalov, Valentin Pavlovich; Kovtunenko, Leonid Vasillevich; Shteinbok, Alexandr Julievich; Mandelshtam, Elena Yakovlevna; and Korotkevich, Boris Sergeevich, 3,972,863.

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Kabushiki Kaisha Toyoda Jidoshokki Sakusho: *See*—
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Kabushiki Kaisha Yashica: *See*—
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Kagan, George M.: *See*—
Gottesman, Roy T.; Kagan, George M.; and Fath, Joseph, 3,972,825.

Kageyama, Yoichi, to Mitsubishi Chemical Industries Ltd. Method of decomposing halohydrocarbons. 3,972,979, Cl. 423-240.000.

Kahn, Leonard R. Carrier isolation system. 3,973,203, Cl. 325-330.000.

Kaizerman, Samuel; and Saxon, Robert, to American Cyanamid Company. Sulfur vulcanizable ethylene-vinyl acetate copolymer elastomers. 3,972,857, Cl. 260-79.50C.

Kaji, Tetsunori: *See*—
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Kakumoto, Shigeru; Hananoi, Toshihiro; and Endou, Hirohide, to Hitachi, Ltd. Pattern preliminary processing system. 3,973,239, Cl. 340-146.3AG.

Kakunodate, Masamichi; and Nakamoto, Soichi, to Canon Kabushiki Kaisha. Light measuring system of camera. 3,973,266, Cl. 354-31.000.

Kalitin, Viktor Alexandrovich: *See*—
Serkov, Arkady Trofimovich; Sokolovsky, Boris Matveevich; Kalitin, Viktor Alexandrovich; and Shishkina, Nina Petrovna, 3,972,209.

Kalman, Gabor Ujhelyi. Patient monitoring system. 3,972,320, Cl. 128-2.10A.

Kalninsh, Arvid Yanovich: *See*—
Pormale, Milda Yanovna; Kashkina, Nadezhda Alexandrovna; Veinberg, Elfrida Indrikovna; Kalninsh, Arvid Yanovich; Shusters, Janis; Mikazhans, Valdis Danielovich; Purvinsh, Indulis Valdovich; and Skutelis, Antons Petrovich, 3,973,007.

Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to L'Oreal. Diphenylamines for dyeing keratinous fibers. 3,972,937, Cl. 260-571.000.

Kamaike, Hiroshi: *See*—
Anzai, Nobuo; and Kamaike, Hiroshi, 3,973,175.

Kamei, Hirotake; Ozawa, Takeo; Nozaki, Ken; and Morikawa, Takitaro, to Agency of Industrial Science & Technology. Method for producing electrical energy by means of liquid crystal devices. 3,972,733, Cl. 136-89.000.

Kamen, Barton A.: *See*—
Caston, J. Douglas; and Kamen, Barton A., 3,972,991.

Kaminski, Perry W., to Texas Instruments Incorporated. Pushbutton keyboard assembly having pole and inner contacts simultaneously engaged by a bridging contact. 3,973,091, Cl. 200-5.00A.

Kamra, Girish Mohan. Cooking appliance. 3,972,276, Cl. 99-443.00R.

Kandou, Akiyoshi, to Yoshida Kogyo Kabushiki Kaisha. Sliding clasp fastener. 3,972,095, Cl. 24-205.11F.

Kaneda, Shigemasa: *See*—
Morosawa, Kaoru; Maruyama, Iwao; Kaneda, Shigemasa; Nishimura, Mitsuo; Taki, Kiyoshi; and Kuninori, Takeshi, 3,972,844.

Kansai Paint Company, Ltd.: *See*—
Nikaido, Norio; and Iihashi, Mototaka, 3,972,845.

Kapner, Robert S.; Kippax, Donald L.; Murphy, Kevin E.; and Udani, Lalitkumar H., to General Electric Company. Process for the formation of 2,6-diphenyl-phenol. 3,972,951, Cl. 260-620.000.

Kappler, Gilbert O. Apparatus for delimbing trees. 3,972,358, Cl. 144-3.00R.

Kapples, Lawrence J. Combined closure and pouring device. 3,972,453, Cl. 222-530.000.

Karady, Sandor: *See*—
Weinstock, Leonard M.; Karady, Sandor; and Sletzinger, Meyer, 3,972,947.

Karev, Boris Dmitrievich: *See*—
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Karim, Aziz; Marsheck, William J.; and Weier, Richard M., to G. D. Searle & Co. 6β,17-Dihydroxy-7α-(lower alkoxy)carbonyl-3-oxo-17α-pregn-4-ene-21-carboxylic acid γ-lactones and congeners. 3,972,871, Cl. 260-239.570.

Kariya, Noboru, to Nard Institute, Ltd. Alicyclic amino compounds and their production. 3,972,929, Cl. 260-563.00P.

Karlberger, Walter Johann, to Morgardshammar Aktiebolag. Device for braking rolled stock. 3,972,402, Cl. 193-35.00A.

Karlsson, Tore S.: *See*—
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Karplus, Henry H. B., to United States of America, Energy Research and Development Administration. Ultrasonic transducer with laminated coupling wedge. 3,973,152, Cl. 310-8.300.

Kashkina, Nadezhda Alexandrovna: *See*—
Pormale, Milda Yanovna; Kashkina, Nadezhda Alexandrovna; Veinberg, Elfrida Indrikovna; Kalninsh, Arvid Yanovich; Shusters, Janis; Mikazhans, Valdis Danielovich; Purvinsh, Indulis Valdovich; and Skutelis, Antons Petrovich, 3,973,007.

Kaspers, Helmut: *See*—
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Widdig, Arno; Urbschat, Ewald, deceased; Grewe, Ferdinand; and Kaspers, Helmut, 3,972,905.

Kasprow, Robert Felix, to United Technologies Corporation. Platform seal-tangential blade. 3,972,645, Cl. 416-215.000.

Kastinger, Hermann. Skiing boot. 3,972,134, Cl. 36-118.000.

Kataoka, Shoei, to Agency of Industrial Science & Technology. Method and apparatus for detecting uneven magnetic field by hall effect in semiconductor. 3,973,182, Cl. 324-45.000.

Kataoka, Shoei, to Agency of Industrial Science & Technology. Method and apparatus for detecting uneven magnetic field by a change in resistance of semiconductor element. 3,973,183, Cl. 324-46.000.

Kataoka, Tsuneo: *See*—
Yatsunami, Kazuharu; Miyakado, Satoru; Shiohara, Katsuaki; Kataoka, Tsuneo; and Honda, Akira, 3,972,411.

Katayama, Hajime: *See—*
Komori, Shigehiro; Goshima, Yoshitomo; Katayama, Hajime; and Miyamoto, Koichi, 3,972,612.

Kato, Minoru; and Sakurai, Yasuhiko, to Nippondenso Co., Ltd. Flasher apparatus for vehicle. 3,973,238, Cl. 340-81.00R.

Katsumato, Malcolm T.: *See—*
Hamilton, Wilson S.; Katsumato, Malcolm T.; Lea, James M.; and Trepus, George E., 3,972,850.

Kaufman, John G. Body electrode for electro-medical use. 3,972,329, Cl. 128-2.06E.

Kaufman, Marvin L.: *See—*
Metzger, Sidney H.; Kaufman, Marvin L.; and Over, John E., 3,972,910.

Kawabata, Yasuhiro, to Aisin Seiki Kabushiki Kaisha. Thermostatically responsive valve. 3,972,472, Cl. 236-87.000.

Kawahara, Kiyoshi: *See—*
Fukushima, Seitaro; Kawahara, Kiyoshi; and Sugawara, Yukio, 3,972,691.

Kawahara, Sei; Takagi, Akira; and Nozawa, Hirosi, to Fuji Photo Film Co., Ltd. Coating method. 3,972,762, Cl. 156-196.000.

Kawamura, Takeji. Shot gun. 3,972,142, Cl. 42-69.00R.

Kawase, Shoji: *See—*
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Kawawa, Shigenobu: *See—*
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Kayahara, Kenji: *See—*
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Kearsley, Wayne A., to Flash Technology Corporation of America. Wiring circuits and method for multiple flash-beacons. 3,973,168, Cl. 315-232.000.

Keiner, John Anthony, to Lever Brothers Company. Hair preparation containing a fluoropolymer. 3,972,998, Cl. 424-70.000.

Keiter, Richard C., to Hewlett-Packard Company. YIG tuned mixer. 3,973,204, Cl. 325-448.000.

Keith, Roger H., to Minnesota Mining and Manufacturing Company. High temperature welding backup strip. 3,972,466, Cl. 228-216.000.

Kemos Incorporated: *See—*
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Kendall Company, The: *See—*
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Kennedy, Jesse: *See—*
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Kennedy, Robert: *See—*
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Kenyon, David L. Automobile lock removal tool. 3,972,103, Cl. 29-263.000.

Kepler, C. Edward; and Guile, Roy N., to United Technologies Corporation. Single nozzle free-vortex aerodynamic window. 3,973,218, Cl. 331-94.50C.

Keplinger, Edward G.: *See—*
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Kesinger, Donald E.; and Aaron, Michael B., to NCR Corporation. Paper transport mechanism. 3,972,460, Cl. 226-6.000.

Kesler, Gordon Maynard. Ski rack for vehicles with outside mounted tires. 3,972,457, Cl. 224-42.42R.

Kessels, Henricus Mathias Marie, to U.S. Philips Corporation . Specimen holder for an X-ray diffraction apparatus. 3,973,120, Cl. 250-272.000.

Keur, Robert I., to A. B. Dick Company. Miniature ink jet nozzle. 3,972,474, Cl. 239-102.000.

Key, James A. Minnow bucket with water aerating means. 3,972,145, Cl. 43-57.000.

Kholkin, Mars Mikhailovich: *See—*
Tsygankov, Mikhail Stepanovich; Bitjutskaya, Nina Alexandrovna; Fateeva, Vera Nikonorovna; Kosholkin, Valery Nikolaevich; Karev, Boris Dmitrievich; Kudinov, Nikolai Alexeevich; Kholkin, Mars Mikhailovich; Moiseev, Nikolai Nikiforovich; and Malandin, Oleg Georgievich, 3,972,736.

Kiellarson, Folke; Roos, Sven; and Quist, Thomas, to AB Akerlund & Rausing. Process for packaging goods in a steam atmosphere. 3,972,153, Cl. 53-22.00A.

Kikkawa, Takahiro; Hirata, Toshinori; Miyaji, Waichi; Tokunaga, Kouichi; Otu, Hidetosi; Tanigawa, Mikiya; and Yamazaki, Yasuhiro, to Hachinohe Smelting Co., Ltd.; Mitsui Kinzoku Engineering Service Co., Ltd.; and Mitsui Mining & Smelting Co., Ltd. Method and apparatus for automatically casting non-ferrous metal. 3,972,368, Cl. 164-76.000.

Kim, Quang Pham: *See—*
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Kimberly-Clark Corporation: *See—*
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Kimura, Yoshio; and Himeno, Kiyoshi, to Mitsubishi Chemical Industries Ltd. Oxyquinophthalone coloring material. 3,972,885, Cl. 260-289.0GP.

King, Arthur S. Fluid treater having intensified electric field. 3,972,800, Cl. 204-302.000.

King, Ellwood J., to Catalyst Research Corporation. Thermal deferred action battery. 3,972,734, Cl. 136-90.000.

King Radio Corporation: *See—*
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King, Ralph Ligon, Jr.: *See—*
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Kinouchi, Yoshitaka: *See—*
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Kinzel, Peter: *See—*
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Kippax, Donald L.: *See—*
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Kirchoff, George F.; and Schneiter, Fred E., to Thiokol Corporation. Multi-level cool gas generator. 3,972,545, Cl. 280-735.000.

Kirkpatrick, Joel L.: *See—*
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Kirsten, Charles C.: *See—*
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Kitachi Chemical Company, Ltd.: *See—*
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Kitamura, Shuji: *See—*
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Kiyohara, Takehiko: *See—*
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Kjarsgaard, Torben. Lead straightening, aligning, and spacing implement for an electronic semi-conductor package. 3,972,356, Cl. 140-147.000.

Klantke, Herbert; and Schindler, Herbert. Apparatus for applying an adhesive to an insole. 3,972,303, Cl. 118-3.000.

Kleeman, Thomas; and Rothmayr, Willy, to Societe d'Assistance Technique pour Produits Nestle S.A. Treatment of condensates. 3,972,809, Cl. 210-24.000.

Klein, Bruce William: *See—*
Jacko, Michael George; and Klein, Bruce William, 3,972,394.

Klein, Hans Joachim; Rupprecht, Manfred; Wonneberg, Heinz; and Geiger, Julius, to AGFA-Gevaert, A.G. Process and apparatus for detecting longitudinal faults on moving webs of material. 3,972,624, Cl. 356-200.000.

Klein, Heinrich; and Pieper, Rudolf, to Siemens Aktiengesellschaft. Arrangement for energy recovery in the pure-gas outlet of a centrifugal separator. 3,972,698, Cl. 55-261.000.

Kleiner, Hans-Jerg: *See—*
Finke, Manfred; Kleiner, Hans-Jerg; Stahler, Gerhard; and Dehmer, Klaus, 3,972,923.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
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Kloosterboer, Johan George, to U.S. Philips Corporation. Differentially kinetic determination of metal ions. 3,972,680, Cl. 23-230.00R.

Knapp, Heinrich: *See—*
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Knapp, Jimmie L. Indicating target for projectiles. 3,972,531, Cl. 273-102.20R.

Knapp, Kenneth K.; Cornell, Charles R.; and Hicks, Edwin D., to Eaton Corporation. Control for hydrostatic transmissions. 3,972,189, Cl. 60-444.000.

Knittel, Anthony, to Unisearch Limited. Method for vapor growing crystals. 3,972,689, Cl. 23-294.00R.

Knoll International, Inc.: *See—*
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Knorr-Bremse GmbH: *See—*
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Kobayashi, Hidetoshi; Niitani, Yoshiaki; and Abiru, Hilomithu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Insecticidal device. 3,972,993, Cl. 424-15.000.

Kobayashi, Masao: *See—*
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Kobylinski, Thaddeus P.: *See—*
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Kodama, Takuya: *See—*
Kodama, Yutaka; Kodama, Tsutomu; Takai, Akira; Senoura, Masaakira; Watanabe, Isao; Tanaka, Katsunori; Yamaguchi, Tomonobu; Abe, Norio; and Kodama, Takuya, 3,972,882.

Kodama, Tsutomu: *See—*
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Kodama, Yutaka; Kodama, Tsutomu; Takai, Akira; Senoura, Masaakira; Watanabe, Isao; Tanaka, Katsunori; Yamaguchi, Tomonobu; Abe, Norio; and Kodama, Takuya, to Toyama Chemical Co., Ltd. Sym.-triazine carbamates. 3,972,882, Cl. 260-249.500.

Koehler, Frank Theodore, Jr.: *See—*
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Koflach Sportgerate Ges. m.b.H.: *See—*
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Kohaut, John E., to Raceway Components, Inc. Electrical insert device. 3,972,579, Cl. 339-34.000.
Kohn, Edward M., to Sun Oil Company of Pennsylvania. Use of hot buoyant liquid to convert pitch to continuous carbon filament. 3,972,968, Cl. 264-29.200.
Kohn, Gustave, administrator: *See—*
Brown, Melancthon S., deceased, 3,972,889.
Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
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Kolmar Laboratories, Inc.: *See—*
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Komaki, Shojiro, to Kabushiki Kaisha Daini Seikosha. Quartz crystal vibrator unit. 3,973,148, Cl. 310-8.900.
Komakine, Chukei. Feedstuff for fowl, fish and domestic animals. 3,973,054, Cl. 426-641.000.
Komori, Shigehiro; Goshima, Yoshitomo; Katayama, Hajime; and Miyamoto, Koichi, to Canon Kabushiki Kaisha. Duplex copying apparatus. 3,972,612, Cl. 355-26.000.
Kondo, Kunihiko: *See—*
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Kondo, Terutake; and Yokozawa, Syunya, to Kitachi Chemical Company, Ltd. Method of making laminate sheets for printed circuit boards. 3,972,765, Cl. 156-315.000.
Konig, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl-Georg, to Bayer Aktiengesellschaft. Penicillins. 3,972,869, Cl. 260-239.100.
Konig, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl-Georg, to Bayer Aktiengesellschaft. Penicillins. 3,972,870, Cl. 260-239.100.
Konkel, Joseph, to Data Printer Corporation. Type train assembly for printing machines. 3,972,282, Cl. 101-111.000.
Kopf, Rowland J., to Kopf, Rowland J.; and DiSantis, Madeleine E. Hardness testing probe assembly. 3,972,229, Cl. 73-85.000.
Koppers Company, Inc.: *See—*
Gouye, Emmanuel V.; and Radaci, Gerald S., 3,972,781.
Korhel, John S., to Metallurgical Exoproducts Corporation. Adjustable sideboard suspension means. 3,972,502, Cl. 249-198.000.
Kornilova, Tatyana Alexeevna: *See—*
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Kosikowski, Frank V.; and Jolly, Ramesh C., to Cornell Research Foundation, Inc. Flavor development by microbial lipases in pasteurized milk blue cheese. 3,973,042, Cl. 426-35.000.
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Kovaleski, Joseph J. Tension brush with adjustable brake. 3,972,489, Cl. 242-128.000.
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Koyama, Hiroaki, to Nippon Kynol Inc. Process for preparing phenolic filaments. 3,972,959, Cl. 260-841.000.
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Kramer, Wolfgang; Buchel, Karl Heinz; Brandes, Wilhelm; and Frohberger, Paul-Ernst, to Bayer Aktiengesellschaft. 1-Phenoxy-1-[halo-1,2,4-triazolyl-(1)]-3,3-dimethyl-butan-2-ones. 3,972,891, Cl. 260-308.00R.
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Kunz, Raymond J., to Leco Corporation. Multifaceted mirror structure for infrared radiation detector. 3,972,598, Cl. 350-293.000.
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Lawton, Ernest L., to Monsanto Company. Preparation of carbodiimides from ureas by dehydration. 3,972,933, Cl. 260-566.00R.
Laxen, Torolf Tom Paul, to Oy Keskuslaboratorio-Centrallaboratorium AB. Device for determination of chemicals in a sample flow. 3,972,792, Cl. 204-195.00R.
Lazar, John Daniel, Jr. Bar stock shear. 3,972,257, Cl. 83-198.000.
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Lening, George O. Pipe coupling. 3,972,639, Cl. 403-191.000.
Lenoir, Jacques, Antonine. Utensil for oven cooking. 3,972,318, Cl. 126-348.000.
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Lewis, Thomas Maldwyn, to Vagabond Films Establishment. Building modules. 3,972,162, Cl. 52-69.000.
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Lindstrom, Stig, to Jorns Mekan AB. Vegetation cleaning unit. 3,972,158, Cl. 56-13.600.
Link, Helmut, to Index-Werke KG Hahn & Tesaky. System for supplying hydraulic fluid to aggregates on spindles or the like. 3,972,246, Cl. 74-360.000.
Linthicum, James D.; and Wisebaker, Robert E., to National Machinery. Bar end dropper for forging machines or the like. 3,972,211, Cl. 72-14.000.
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Lissoni, Adelio, to S.I.A.T. - Societa' Internazionale Applicazioni Tecniche S.p.A. Tool for distributing adhesive tape. 3,972,769, Cl. 156-577.000.
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Livingston, James D., to General Electric Company. Co-Si-X aligned eutectics. 3,972,746, Cl. 148-32.000.
Livingston, James D., to General Electric Company. Co-Si-X aligned eutectics. 3,972,747, Cl. 148-32.000.
Livingston, James D., to General Electric Company. Co-Si-X aligned eutectics. 3,972,748, Cl. 148-32.000.
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Lobb, Daniel Richard, to Redifon Limited. Compound optical system with image tilt compensation. 3,972,584, Cl. 350-48.000.
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Lohaus, Gerhard; and Dittmar, Walter, to Hoechst Aktiengesellschaft. Process for the preparation of 1-hydroxy-pyridones. 3,972,888, Cl. 260-297.00Z.
London, Joe F., Jr.; and Lauber, Jean-Louis, to Burlington Industries, Inc. Textured yarn and fabric. 3,972,174, Cl. 57-140.00J.
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Lowell, Philip S., to Radian Corporation. Process removing sulfur dioxide from gases. 3,972,980, Cl. 423-242.000.

Loxley, Ted A.; Barber, Walter G.; Combs, Walter W.; and Webb, John M., to Sherwood Refractories, Inc. Apparatus for making vitreous silica receptacles. 3,972,704, Cl. 65-157.000.

Lubinec, William. Automatic prompter. 3,972,603, Cl. 352-4.000.

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Lynn, Howard D. Feedlot animal wastes into useful materials. 3,973,043, Cl. 426-55.000.

Lyons, James E., to Sun Ventures, Inc. Group VIII metal complex catalyzed halogen exchange reaction. 3,972,953, Cl. 260-651.00R.

M & J Valve Company: *See—*
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Machado, Roberto L.; Eisenberg, Benjamin; and Baumann, George P., to Exxon Research and Engineering Company. Process for removing acid from hydrocarbons. 3,972,692, Cl. 55-23.000.

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MacMillan Bloedel Limited: *See—*
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Mahaffy, Reid A.; and Hamilton, Joel A., to Mahaffy & Harder Engineering Company. Packaging techniques for semi-rigid packages. 3,972,155, Cl. 53-30.00R.

Mail, Paul; Ferrin, Charles R.; and Ely, Richard J., to Change, Inc. Oil extractor. 3,972,816, Cl. 210-259.000.

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Malaval, Claude. Hot source having slight bulk. 3,972,370, Cl. 165-163.000.

Malcolm, Brian Anthony, to Simon-Carves Limited. Safety equipment. 3,972,442, Cl. 220-89.00A.

Malizia, Peter Donato: *See—*
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Malone, Steve G.; and Langford, Obie M., to Texaco Inc. Pulsed neutron logging: multipurpose logging sonde for changing types of logs in the borehole without bringing the sonde to the surface. 3,973,131, Cl. 250-502.000.

Maloney, Thomas C., to Burroughs Corporation. Display panel for displaying bars of light. 3,973,166, Cl. 315-169.0TV.

Maly, George P.; and Tannahill, Clifton A., to Union Oil Company of California. Method of protecting a pile imbedded in offshore areas having a shifting layer of mud. 3,972,198, Cl. 61-98.000.

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Manley, Russell E., to Manley Bros. of Indiana, Inc. Pneumatic classifier with particle removal system. 3,972,808, Cl. 209-133.000.

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Mansson, Sven E., to Magnetic Analysis Corporation. Ultrasonic nondestructive pulse testing apparatus. 3,972,228, Cl. 73-67.700.

Marforio, Nerino, to Rockwell-Rimoldi S.p.A. Device for cutting and inserting a continuously fed ribbon underneath the pressure foot of a sewing machine. 3,972,296, Cl. 112-121.270.

Marie, Claude: *See—*
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Markham, John Lucien, to Dunlop Limited. Reclamation of fluoropolymers. 3,972,842, Cl. 260-2.300.

Markhart, Albert H.; and Cahill, David R., to Monsanto Company. Process of manufacture of dielectric recording media. 3,973,055, Cl. 427-58.000.

Markley, Lowell D., to Dow Chemical Company, The. Substituted benzenemethanol compounds. 3,972,913, Cl. 260-488.0CD.

Marola, Americo E., to Torrington Company, The. Cage for an overrunning clutch. 3,972,573, Cl. 308-217.000.

Mars Limited: *See—*
Buckley, Keith; and Mitchell, John Richard, 3,973,051.

Marsden, Howard A.: *See—*
Haak, Willard J.; Marsden, Howard A.; and Sturges, James R., 3,972,267.

Marsee, Frederick J., to Ethyl Corporation. Method and apparatus for heating an intake system on an internal combustion engine. 3,972,313, Cl. 123-122.00A.

Marsee, Frederick J., to Ethyl Corporation. Fuel induction system. 3,972,324, Cl. 123-122.0AC.

Marseillan, Jorge. Movable fence to control cattle pasturage. 3,972,307, Cl. 119-20.000.

Marshall, Elmer, to Olinkraft, Inc. Method of sealing corrugated board. 3,972,270, Cl. 93-58.00R.

Marshall, Winston S., to Eli Lilly and Company. 3-Substituted phenylalkyl amines. 3,972,934, Cl. 260-570.80R.

Marsheck, William J.: *See—*
Karim, Aziz; Marsheck, William J.; and Weier, Richard M., 3,972,871.

Martin, Frederick H.: *See—*
Tsuk, Andrew G.; and Martin, Frederick H., 3,972,995.

Martin, Frederick Raymond Patrick, to Lucas Electrical Company Limited, The. Headlamp tilting device in a motor vehicle. 3,973,114, Cl. 240-7.1LJ.

Martini, Robert Joseph Ferdinand. Mechanism for flush systems. 3,972,076, Cl. 4-37.000.

Martinsson, Eva Margareta; and Hellsten, Karl Martin Edvin, to Modokemi Aktiebolag. Quaternary ammonium compounds and treatment of plastic and other materials therewith. 3,972,855, Cl. 260-567.60M.

Maruyama, Iwao: *See—*
Morosawa, Kaoru; Maruyama, Iwao; Kaneda, Shigemasa; Nishimura, Mitsuo; Taki, Kiyoshi; and Kuninori, Takeshi, 3,972,844.

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Mason, Anthony, to Whirlpool Corporation. Multispeed timer dryer control. 3,972,130, Cl. 34-45.000.

Mason, Mark T.; and Bourgoine, Michael L., to New Hampshire Ball Bearings, Inc. Electronic survey target. 3,972,622, Cl. 356-172.000.

Mason & Porter Limited: *See—*
Boswell, Gordon Henry, 3,972,160.

Mason, William T., Jr, to General Motors Corporation. Tractor-trailer aerodynamic drag reducer. 3,972,556, Cl. 296-1.00S.

Massieon, Charles G., to Caterpillar Tractor Co. Wear-resistant composite track shoe. 3,972,570, Cl. 305-54.000.

Mathais, Henri; Schirmann, Jean-Pierre; and Weiss, Francis, to Produits Chimiques Ugine Kuhlmann. Method for preparing symmetrical and unsymmetrical ketazines and mixtures thereof. 3,972,874, Cl. 260-240.00G.

Mathias, Richard G.: *See—*
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Matsuda, Tadayoshi; Yuasa, Mitsuo; and Aoyama, Kenji, to Tokyo Shibaura Electric Co., Ltd. X-ray tomography apparatus. 3,973,127, Cl. 250-445.00T.

Matsui, Hirotoshi: *See—*
Washizuka, Isamu; Hashimoto, Shintaro; and Matsui, Hirotoshi, 3,973,111.

Matsumoto, Seiichi: *See—*
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Matsuo, Takashi: *See—*
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Matsuo, Takatoshi: *See—*
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Matsuzawa, Hideo: *See—*
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May, Carl Jerome, Jr., to Bell Telephone Laboratories, Incorporated. Digital echo suppressor break-in circuitry. 3,973,086, Cl. 179-170.200.
McCarthy, James R., Jr., to Dow Chemical Company, The. N,N'-Disubstituted benzamidines. 3,972,931, Cl. 260-564.00R.
McCaskie, John: *See—*
Nobel, Fred I.; and McCaskie, John, 3,972,787.
McClain, Dorothee M.; and Vest, Betty L., to National Distillers and Chemical Corporation. Finely divided saponified ethylene-vinyl acetate interpolymers. 3,972,865, Cl. 526-14.000.
McClelland, Alex J., to Warner & Swasey Company, The. Chuck actuator assembly. 3,972,537, Cl. 279-4.000.
McCormick, Ronald O.; and Slonaker, Robert O., to Owens-Corning Fiberglas Corporation. Method and apparatus for producing fibers from heat-softenable materials. 3,972,702, Cl. 65-1.000.
McCracken, Leonard Dean; and Wallace, Thomas John, to Pepsico Inc. Baseball bat grip. 3,972,528, Cl. 273-72.00A.
McCulloch Corporation: *See—*
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McDonnell Douglas Corporation: *See—*
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McGuire, Joseph C., 3,972,353.
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McKeefry, Jerry L., to Paper Converting Machine Company. Apparatus for handling business forms. 3,972,520, Cl. 270-52.500.
McLaughlin, James H.; and Bajek, Walter A., to Universal Oil Products Company. Control of hydrogen/hydrocarbon mole ratio in hydrogen-consuming process. 3,972,804, Cl. 208-108.000.
McLaughlin, Robert B., to Lockheed Missiles & Space Company, Inc. Horizontal hydrophone array. 3,973,236, Cl. 340-7.0PC.
McMorris, Daniel W.; and Skidmore, William J., III, to Becton, Dickinson and Company. Particle counter. 3,973,194, Cl. 324-71.0CP.
McNeil, Walter F. Reinforced tubular materials and process. 3,972,529, Cl. 273-80.00B.
McVeen, Milford D., to Towmotor Corporation. Lift truck mast assembly with a resilient chain positioner. 3,972,388, Cl. 187-9.00E.
Mecklenburg, Clifford G.; and Evans, Charles T., to Allis-Chalmers Corporation. Order picker with operator's platform on the front end of the load support. 3,972,434, Cl. 214-730.000.
Medina, Glen J.: *See—*
Field, Jesse L., Jr.; and Medina, Glen J., 3,972,264.
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Medina, Glenn J.: *See—*
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Mehnert, Gotfried, to Bekum Maschinenfabriken GmbH. Multi-stage blowmolding apparatus. 3,972,669, Cl. 425-326.00B.
Melcharick, Juergen, to Union Special Corporation. Sewing machine position and speed sensing system. 3,972,297, Cl. 112-219.00A.
Meller, Oscar W.: *See—*
Lovich, John W.; Meller, Oscar W.; and Morse, Frank C., 3,972,437.
Melton, Donald F.; and Neumeier, Karl E., to Programmed & Remote Systems Corporation. Energy absorbing device. 3,972,390, Cl. 188-1.00C.
Melzer, Roland, to R. Melzer oHG Machinenbau und Metallverarbeitung. Apparatus for the zig-zag folding of a web of material. 3,972,519, Cl. 270-30.000.
Menzi, Ulrich; and Clavel, Raymond, to Hermes Precisa International S.A. Typewriter shift mechanism. 3,972,404, Cl. 197-71.000.
Mercatoris, Robert, to Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED. Lance for steel smelting. 3,972,515, Cl. 266-225.000.
Merck & Co., Inc.: *See—*
Anderson, Paul S., 3,973,017.
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Dolling, Ulf-H.; Grabowski, Edward J. J.; Schoenewaldt, Erwin F.; and Sletzinger, Meyer, 3,972,921.
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Messerschmidt, Klaus, to Sebastian Messerschmidt, Spezialmaschinenfabrik, Firma. Reciprocating press. 3,972,216, Cl. 72-337.000.
Metallgesellschaft Aktiengesellschaft: *See—*
Cornelius, Gerhard; Jockel, Heinz; and Kupfer, Hans, 3,972,688.
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Metzger, Karl-Georg: *See—*
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Konig, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl-Georg, 3,972,870.
Metzger, Sidney H.; Kaufman, Marvin L.; and Over, John E., to Bayer Aktiengesellschaft. Preparation of a chlorinated diisocyanate. 3,972,910, Cl. 260-453.0PH.
Meyer, Horst, to Hermann C. Starchk Berlin. Method of upgrading tantalum and niobium concentration in slags. 3,972,710, Cl. 75-101.00R.
Meyer, Walter E., to Koehring Company. Peak detector. 3,973,197, Cl. 324-103.00P.
Meyer, Willy: *See—*
Bohner, Beat; and Meyer, Willy, 3,973,011.
Meyers, Sanford. Bag holding and opening apparatus. 3,972,157, Cl. 53-384.000.
Meyers, William G.: *See—*
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Michalko, Edward, to Universal Oil Products Company. Method of depositing a catalytically active metallic component on a carrier material. 3,972,829, Cl. 252-430.000.
Michalko, Edward; and Hilfman, Lee, to Universal Oil Products Company. Hydrotreating catalyst. 3,972,833, Cl. 252-453.000.
Michibayashi, Tatuya: *See—*
Kubo, Hiroshi; Michibayashi, Tatuya; Seki, Nansho; and Sato, Noriyuki, 3,972,909.
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Midland-Ross Corporation: *See—*
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Mikolajczyk, Raymond F. Device for measuring the length of a member. 3,972,124, Cl. 33-134.00R.
Millar, Robert F.: *See—*
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Miller, Arthur O., to Hewlett-Packard Company. Telephone number assignment record verification apparatus and method. 3,973,090, Cl. 179-175.30A.
Miller, Benton S.; Lee, William Douglas; and King, Ralph Ligon, Jr., to Mount Vernon Dryer Felt Co. Seam gripping device. 3,972,105, Cl. 29-283.000.
Miller, Paul J.; and Daugherty, Harold R., to Weatherhead Company, The. Tilt responsive shut-off valve. 3,972,340, Cl. 137-38.000.
Miller, Raphael W. Highway joint with spring torsion bar. 3,972,640, Cl. 404-62.000.
Miller, Richard W.; Felton, Gerald L.; and Petros, Kenneth W., to Foxboro Company, The. Vortex flow meter apparatus. 3,972,232, Cl. 73-194.0VS.
Miller, Robert: *See—*
Derderian, Carl; and Miller, Robert, 3,972,757.
Millhollan, Michael S.; and Treadway, Ronald L., to Motorola, Inc. Sense-write circuit for bipolar integrated circuit ram. 3,973,246, Cl. 340-173.0FF.
Milne, William G. Airship for transporting gas. 3,972,492, Cl. 244-30.000.
Milne, William G. Docking device for a dirigible. 3,972,493, Cl. 244-115.000.
Minami, Masana; and Sekizawa, Hidekazu, to Tokyo Shibaura Electric Co., Ltd. Apparatus for detecting the defects of the mask pattern using spatial filtering. 3,972,616, Cl. 356-71.000.
Mink, George. Material handling apparatus. 3,972,422, Cl. 214-1.0BB.
Minnesota Mining and Manufacturing Company: *See—*
Anderson, Gerald S.; Holm, John D.; Jacobson, Richard L.; and Smith, Ronald E., 3,973,072.
Appeldorn, Roger H.; and Anderson, Raymond H., 3,972,593.
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Keith, Roger H., 3,972,466.
Mitsch, Ronald A.; and Zollinger, Joseph La Mar, 3,972,856.

Minnicino, Michael Anthony, to Dresser Industries, Inc. Variable volume clearance chamber for compressors. 3,972,652, Cl. 417-277.000.

Minnick, Robert C.; Bailey, Paul T.; Sandfort, Robert M.; and Semon, Warren L. Non-conservative bubble logic circuits. 3,973,248, Cl. 340-174.0TF.

Mirra, Michael J.: *See—*
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Misfeldt, Charles C., to United States of America, Navy. Dielectric circuit board bonding. 3,972,755, Cl. 156-3.000.

Mishark, Joseph E.: *See—*
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Misonoo, Kazunaga, to Kozo, Yoshizaki. Deep drawing of cup-shaped article for easy removal from punch. 3,972,217, Cl. 72-344.000.

Mitchell, Donovan Charles Philpin: *See—*
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Mitchell, Larry D.: *See—*
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Mitchell, William, to Bush Boake Allen Limited. Potassium isohumulate hop extracts. 3,973,052, Cl. 426-592.000.

Mitomo, Isamu; and Kaji, Tetsunori, to Hitachi, Ltd. Line progressive scanning method for liquid crystal display panel. 3,973,252, Cl. 340-324.00M.

Mitra, Gautam: *See—*
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Mitsch, Ronald A.; and Zollinger, Joseph La Mar, to Minnesota Mining and Manufacturing Company. Polyurethanes containing poly(perfluoroalkylene oxides) units. 3,972,856, Cl. 260-77.5AP.

Mitsubishi Chemical Industries Ltd.: *See—*
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Mitsubishi Denki Kabushiki Kaisha: *See—*
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Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
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Mitsubishi Rayon Co., Ltd.: *See—*
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Mitsui Kinzoku Engineering Service Co., Ltd.: *See—*
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Mitsui Mining & Smelting Co., Ltd.: *See—*
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Mittenzwei, Hellmut: *See—*
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Miyaji, Waichi: *See—*
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Miyamoto, Toshio; Mori, Teijiro; Matsuura, Kiyoshi; and Hara, Bungo, to Mitsubishi Denki Kabushiki Kaisha. Circuit interrupter. 3,973,233, Cl. 337-118.000.

Mize, Timothy I. Bicycle seat covering and receptacle therefor. 3,972,539, Cl. 280-289.00S.

Mobil Oil Corporation: *See—*
Butter, Stephen A.; and Kaeding, Warren W., 3,972,832.
Ciric, Julius, 3,972,983.
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Schwab, Frederick C.; and Murray, James G., 3,972,963.

Mobius, Hans Eberhard; and Soraya, Sorayapour. Method and apparatus for treating and annealing ferrous and non-ferrous articles. 3,972,513, Cl. 266-130.000.

Mock, Donald E., to Reed Irrigation Systems. Surround molding with fastener concealment member for use on particle board doors. 3,972,165, Cl. 52-309.000.

Modokemi Aktiebolag: *See—*
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Moe, Per Jacob, to Myrens Verksted A/S. Filter, especially for back water. 3,972,817, Cl. 210-325.000.

Moiseev, Nikolai Nikiforovich: *See—*
Tsygankov, Mikhail Stepanovich; Bitjutskaya, Nina Alexandrovna; Fateeva, Vera Nikonorovna; Kosholkin, Valery Nikolaevich; Karev, Boris Dmitrievich; Kudinov, Nikolai Alexeevich; Kholkin, Mars Mikhailovich; Moiseev, Nikolai Nikiforovich; and Malandin, Oleg Georgievich, 3,972,736.

Mol, Jan, to N.V. Houdstermaatschappij Holland Agro. Method for preparing a mixture of finely crystallized fat and a powder. 3,973,046, Cl. 426-289.000.

Moldex, Inc.: *See—*
Paine, Ellis Howard, 3,973,064.

Molle, Jean Louis; and Boch, Jean Christian, to A.E.C. Societe de Chimie Organique et Biologique. Gulonic acid salt. 3,973,031, Cl. 424-278.000.

Molloy, Bryan B., to Eli Lilly and Company. Antiarrhythmic agents. 3,972,935, Cl. 260-570.00R.

Monsanto Company: *See—*
Alt, Gerhard H.; and Street, Robert W., 3,972,915.
Centofanti, Louis F., 3,972,982.
Grover, John L.; and Power, Wilson H., 3,973,058.
Harken, Russel D.; and Morgan, F. Wyman, 3,972,922.
Ingram, Woodrow Hayes, II, 3,973,070.
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Markhart, Albert H.; and Cahill, David R., 3,973,055.
Morgan, Jewel C., Jr., 3,972,940.

Montrose, Bjorne Thorwald, to Rosenberg-Bischoff, M.; and Bischoff, Jean. Collapsible furniture. 3,972,562, Cl. 297-359.000.

Moore, Charles H., to Dow Chemical Company, The. Method for testing the resilience of solid particles. 3,972,220, Cl. 73-7.000.

Moore, George G. I.; and Harrington, Joseph Kenneth, to Riker Laboratories, Inc. Substituted trifluoromethanesulfonanilides. 3,972,926, Cl. 260-556.00F.

Moreau, Charles: *See—*
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Moreau, Jerry P.: *See—*
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Morgan, F. Wyman: *See—*
Harken, Russel D.; and Morgan, F. Wyman, 3,972,922.

Morgan, Jewel C., Jr., to Monsanto Company. Catalyst suspension foaming inhibition. 3,972,940, Cl. 260-583.00K.

Morgan, Samuel A.; Irwin, Samuel N.; and Butsch, Otto R., to Sycor, Inc. Disc receiver interlock for disc recorders. 3,973,272, Cl. 360-86.000.

Morgan, Samuel A., to Sycor, Inc. Method and apparatus for mounting and positioning magnetic recording heads. 3,973,274, Cl. 360-104.000.

Morgardshammar Aktiebolag: *See—*
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Mori, Atsuo; Kitamura, Shuji; and Yamatsuta, Kohji, to Sumitomo Chemical Company, Limited. Curable urethane resin composition comprising a mixture of polyisocyanate, active hydrogen compound and diketo compound. 3,972,846, Cl. 260-30.40N.

Mori, Teijiro: *See—*
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Mori, Toshihiro; Watanabe, Katsujiro; and Nishisaka, Akihiko, to Nippon Kokan Kabushiki Kaisha. Method for rotationally positioning a welded steel pipe in response to a seam section thereof and an apparatus for positioning the same. 3,972,432, Cl. 214-340.000.

Moriarty, Carole L.; and Tritsch, George L. L-aspartyl-L-phenylglycine esters of lower alkanols. 3,972,860, Cl. 260-112.50R.

Morikawa, Takitaro: *See—*
Kamei, Hirotake; Ozawa, Takeo; Nozaki, Ken; and Morikawa, Takitaro, 3,972,733.

Morita, Hideo: *See—*
Hayashi, Yoshiyuki; and Morita, Hideo, 3,972,260.

Moriyama, Inao; Tanaka, Keiji; Ando, Yujiro; and Ohara, Katsunobu, to Canon Kabushiki Kaisha. Color copying apparatus having one or more screen-like photosensitive members. 3,972,608, Cl. 355-4.000.

Morosawa, Kaoru; Maruyama, Iwao; Kaneda, Shigemasa; Nishimura, Mitsuo; Taki, Kiyoshi; and Kuninori, Takeshi, to Shinto Paint Co., Ltd. Powder coating composition. 3,972,844, Cl. 260-16.000.

Morris, Charles W., to United States of America, Navy. Temperature-sensitive disarming element. 3,972,289, Cl. 102-70.00R.

Morris, James Baker, Sr., to American Micro-Systems, Inc. Push button switch for electronic watch. 3,973,099, Cl. 200-159.00R.

Morris, Richard Milton, Jr.: *See—*
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Morrison, Andrew I.; and Hannah, Bruce R., to Knoll International, Inc. Method of producing an upholstered item of furniture. 3,972,098, Cl. 29-91.100.

Morrison, Glenn C.; and Cetenko, Wiaczeslaw A., to Warner-Lambert Company. Blood pressure reducing hydroxypyrimidines. 3,973,016, Cl. 424-246.000.

Morse, Frank C.: *See—*
Lovich, John W.; Meller, Oscar W.; and Morse, Frank C., 3,972,437.

Mosetti, Jacques; Beccu, Klaus D.; and Jonville, Pierre, to Centre National d'Etudes Spatiales. Method of producing electrodes. 3,972,729, Cl. 136-75.000.

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Pelt, Thomas E.; and Seruga, Edward A., to Badger Meter, Inc. Turbine meter bearing. 3,972,233, Cl. 73-231.00R.
Pemberton, Donald Stuart; and Smith, Gordon Roy Frank, to Rist's Wires & Cables Limited. Electrical terminals. 3,972,580, Cl. 339-47.00R.
Penn, John R., to Bendix Corporation, The. Lining wear sensor. 3,972,391, Cl. 188-1.00A.
Pepsico Inc.: *See—*
McCracken, Leonard Dean; and Wallace, Thomas John, 3,972,528.
Pera, John D.: *See—*
Buckman, John D.; and Pera, John D., 3,973,034.
Perimov, Alexandr Alexeevich: *See—*
Kraizinger, Fedor Vladimirovich; Pogoretsky, Vitaly Vasilievich; Tarpinian, Dmitry Apelovich; Popov, Valery Petrovich; Perimov, Alexandr Alexeevich; and Glinkin, Vladimir Pavlovich, 3,972,517.
Perkins, Charles H., to Robertshaw Controls Company. Reversible refrigerant system and four-way reversing valve therefor or the like. 3,972,347, Cl. 137-596.180.
Pertec Corporation: *See—*
Bleiman, Lewis William, 3,972,535.
Peter, Lothar: *See—*
Peter, Oskar Erich; and Peter, Lothar, 3,972,635.
Peter, Oskar Erich; and Peter, Lothar, 3,972,636.
Peter, Oskar Erich; and Peter, Lothar, to Peter, Oskar Erich. Double conical hub-to-shaft connection. 3,972,635, Cl. 403-13.000.
Peter, Oskar Erich; and Peter, Lothar, to Peter, Oskar Erich. Hub-to-shaft coupling. 3,972,636, Cl. 403-374.000.
Peters, Laurence R.: *See—*
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Petros, Kenneth W.: *See—*
Miller, Richard W.; Felton, Gerald L.; and Petros, Kenneth W., 3,972,232.
Petrov, Gennady Nikolaevich; Tolstopyatov, Gennady Mikhailovich; Krasilnikov, Sergei Mikhailovich; Juzhakov, Nikolai Alexandrovich; Kornilova, Tatyana Alexeevna; Lashova, Svetlana Mikhailovna; Shatalov, Valentin Pavlovich; Kovtunenko, Leonid Vasillevich; Shteinbok, Alexandr Julievich; Mandelshtam, Elena Yakovlevna; and Korotkevich, Boris Sergeevich. Method for preparing copolymers from conjugated dienes and monovinylaromatic compounds with random distribution of monomer units. 3,972,863, Cl. 526-340.000.
Pettit, Jack Leland: *See—*
Parish, Harold Cheney; Allard, Michael Duane; Pettit, Jack Leland; and Spulgis, Ivars Sigurds, 3,972,451.
Pfaender, Lawrence V.: *See—*
Nolan, James F.; Baker, Theodore C.; Bode, Wolfgang W.; Mathias, Richard G.; and Pfaender, Lawrence V., 3,973,164.
Pfeifer, Josef; Schnall, Gunther; and Eppe, Rudolf, to AGFA-Gevaert, A.G. Electrostatic copying machine. 3,972,609, Cl. 355-4.000.
Pfizer Inc.: *See—*
Hamanaka, Ernest S., 3,972,872.
Pflegerl, Emmerich: *See—*
Wulf, Horst-Dieter; List, Ferdinand; Orlowski, Friedrich-August; Wilke, Norbert; and Pflegerl, Emmerich, 3,972,912.
Philip Morris Incorporated: *See—*
Iten, Clemens A.; and Rigby, Sidney J., 3,972,417.
Phillips, David C.: *See—*
Fort, Emil M.; Kaczmsrek, Thomas D.; and Phillips, David C., 3,972,225.
Phillips, Edward Graham, to Lucas Electrical Company Limited, The. Control circuits for vehicle rear window heaters. 3,973,140, Cl. 307-247.00A.
Phillips Petroleum Company: *See—*
Bertus, Brent J., 3,972,954.
Carter, Cecil O., 3,972,956.
Costolow, John J., 3,972,854.
Forseth, Glenn J., 3,972,986.
Sanelemente, Amaury, 3,972,985.
Warren, Donald K., 3,972,440.
Phipps, Derek John, to Decca Limited. Synchron timing of signals in spaced transmitters and in a receiver for a phase comparison navigation system using time sequential transmissions. 3,973,261, Cl. 343-105.00R.
Piccone, Dante E., to General Electric Company. Thyristor trigger circuit enabled by thyristor forward voltage level. 3,973,144, Cl. 307-252.00N.
Pickett, John E. P. Rotary valve. 3,972,350, Cl. 137-624.180.
Pico, Francisco A. Manufacture of abrasion-resistant screening apparatus. 3,972,974, Cl. 264-267.000.
Pielkenrood, Jacob, to Pielkenrood-Vinitex B.V. Coalescence apparatus. 3,972,819, Cl. 210-513.000.
Pielkenrood-Vinitex B.V.: *See—*
Pielkenrood, Jacob, 3,972,819.
Pieper, Rudolf: *See—*
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Pierson, Harlan K.: *See—*
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Pietraszek, Thaddeus, to Uniroyal Inc. Platform for footwear and article of footwear. 3,972,135, Cl. 36-30.00R.
Pillsbury Company, The: *See—*
Brandberg, Lawrence C.; and Andreas, David W., 3,973,045.
Reid, Francis R., 3,972,468.
Pineau, Andre: *See—*
Honnorat, Yves; Pineau, Andre; and Cozar, Ricardo, 3,972,752.
Pioneer Electronic Corporation: *See—*
Tamura, Masahiko; Iwama, Kiyonori; and Yoshimi, Toshikazu, 3,973,150.
Pisano, Frank T.: *See—*
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Piston, Albert O.: *See—*
Criscimagna, Tony N.; and Piston, Albert O., 3,973,253.
Pitner, Alfred, to Nadella, a part interest. Thrust rolling bearing having cylindrical rolling elements. 3,972,574, Cl. 308-235.000.
Pitney-Bowes, Inc.: *See—*
Foster, Dean Harold; and Adamoski, William, Jr., 3,972,525.
Pitney, Lennord L.: *See—*
Travor, Bruce W.; and Pitney, Lennord L., 3,972,287.
Pitts, Robert G.; and Welsh, Bruce T., to Warner-Lambert Company. Deodorant compositions containing trans-1,4-diphenyl-2-butene-1,4-dione. 3,972,996, Cl. 424-48.000.
Pittsburgh des Moines Steel Company: *See—*
Adams, John H., 3,972,444.
Plass, Raymond B.: *See—*
Schuitemaker, Theodore; and Plass, Raymond B., 3,972,351.
Plegat, Alain Edouard, to Societe Anonyme des Usines Chausson. Tube and tube-plate assembly. 3,972,371, Cl. 165-178.000.
Plough, Russell H., to Symons Corporation. Spreader bar assembly for a concrete wall form. 3,972,501, Cl. 249-42.000.
Plumadore, John D., to Scott Paper Company. Copyboard. 3,972,613, Cl. 355-75.000.

Piumat, Emile; Schottey, Jean; and Toussaint, Francois, to Glaverbel-Mecaniver. Colored transparent articles. 3,973,069, Cl. 428-218.000.

Plunkett, Jerry D.: *See—*
Fosberg, Michael Allen; Lancaster, James Wallace; Schroeder, Mark Joseph; and Plunkett, Jerry D., 3,972,826.

Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes: *See—*
Champleboux, Jacques; Tailhardat, Franck; and Moreau, Charles, 3,972,354.

Pogoretsky, Vitaly Vasilievich: *See—*
Kraizinger, Fedor Vladimirovich; Pogoretsky, Vitaly Vasilievich; Tarpinian, Dmitry Apelovich; Popov, Valery Petrovich; Perimov, Alexandr Alexeevich; and Glinkin, Vladimir Pavlovich, 3,972,517.

Poignant, Jean-Claude: *See—*
Beregi, Laszlo; Hugon, Pierre; Pascaud, Xavier; and Poignant, Jean-Claude, 3,972,994.

Poje, Albert J.: *See—*
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Polio Establishment Vaduz: *See—*
Vogeli, Ernst, 3,972,167.

Pomaro, Anthony Cosmo. Hair cutting device. 3,972,337, Cl. 132-45.00R.

Pommer, Ernst-Heinrich; Kradel, Juergen; Koenig, Karl-Heinz; and Sanne, Walter, to BASF Aktiengesellschaft. Fungicide. 3,973,018, Cl. 424-248.000.

Popov, Valery Petrovich: *See—*
Kraizinger, Fedor Vladimirovich; Pogoretsky, Vitaly Vasilievich; Tarpinian, Dmitry Apelovich; Popov, Valery Petrovich; Perimov, Alexandr Alexeevich; and Glinkin, Vladimir Pavlovich, 3,972,517.

Population Research Incorporated: *See—*
Bolduc, Lee R.; and Dickhudt, Eugene A., 3,972,331.

Pormale, Milda Yanovna; Kashkina, Nadezhda Alexandrovna; Veinberg, Elfrida Indrikovna; Kalninsh, Arvid Yanovich; Shusters, Janis; Mikazhans, Valdis Danielovich; Purvinsh, Indulis Valdovich; and Skutelis, Antons Petrovich. High-molecular derivative of 2-dimethylaminoethyl ester of p-butylaminobenzoic acid, method for preparing same and application thereof. 3,973,007, Cl. 424-180.000.

Porter, David L., to ACF Industries, Incorporated. Fuel pump having pulsating chambers. 3,972,656, Cl. 417-542.000.

Power, Wilson H.: *See—*
Grover, John L.; and Power, Wilson H., 3,973,058.

Powers, Gilbert L., to W. B. Van Nest Company. Freezing, defrosting and storage assembly. 3,972,279, Cl. 99-516.000.

Powers, Robert W., to General Electric Company. Method of preparing a suspension of additive-free beta-alumina particles. 3,972,480, Cl. 241-15.000.

Poziomek, Edward J.; and Crabtree, Eleanor V., to United States of America, Army. Method of testing a toxic agent alarm with a non-toxic simulant of methanesulfonyl halide. 3,972,783, Cl. 204-1.00T.

Pozniko, John: *See—*
Deeter, Ronald C.; and Pozniko, John, 3,972,375.

PPG Industries, Inc.: *See—*
Drummond, Warren W., 3,972,703.
Fahey, Dennis M., 3,973,071.
Hammel, Joseph J.; and Allersma, Ties, 3,972,720.
Hammel, Joseph J.; and Allersma, Ties, 3,972,721.

Precision-Cosmet Company, Inc.: *See—*
Inns, H. D. E., 3,972,602.

Presley, Rex Wallace; Datwyler, Walter Frederick, Jr.; and Lorraine, Jack Richardson, to Bendix Corporation, The. Combination vehicle yaw stabilizer. 3,972,543, Cl. 280-446.00B.

Pressman, Gerald L., to Electroprint, Inc. Color electrophotography using encoded multicolor information. 3,972,716, Cl. 96-1.200.

Price, Larry V.: *See—*
Puster, Louis M.; and Price, Larry V., 3,972,239.

Price, Vernon L. Adapter assembly for impact tool units with rotatable or oscillatable bits. 3,972,376, Cl. 173-139.000.

Priestley, Eldon Bruce: *See—*
Channin, Donald Jones; and Priestley, Eldon Bruce, 3,973,057.

Prinz, Eckhard; and Henneberg, Wolfgang, to Softal Elektronik GmbH. Apparatus for the treatment of non-conductive foils or like thin sheeting. 3,973,132, Cl. 250-531.000.

Process Products, Inc.: *See—*
Datis, Angelo P., 3,972,201.

Proctor, John S. Upper lip mounted retaining means for medical-surgical tubes. 3,972,321, Cl. 128-348.000.

Prodel, Ulrich Heinrich. Plastic bottle case. 3,972,441, Cl. 220-21.000.

Produits Chimiques Ugine Kuhlmann: *See—*
Mathais, Henri; Schirmann, Jean-Pierre; and Weiss, Francis, 3,972,874.
Schirmann, Jean-Pierre; and Weiss, Francis, 3,972,876.
Schirmann, Jean-Pierre; Combroux, Jean; and Delavarenne, Serge Yvon, 3,972,878.

Programmed & Remote Systems Corporation: *See—*
Melton, Donald F.; and Neumeier, Karl E., 3,972,390.

Prokofiev, Mikhail Ivanovich: *See—*
Volynsky, Alexandr Semenovich; Prokofiev, Mikhail Ivanovich; and Kryachkova, Aida Pavlovna, 3,973,004.

Protta, Jean-Claude, to Oxy Metal Industries Corporation. Apparatus for steering a ship. 3,972,301, Cl. 114-162.000.

Psaar, Hubertus, to Bayer Aktiengesellschaft. Process for isolating easily soluble basic oxazine dyestuffs and phenazine dyestuffs. 3,972,879, Cl. 260-244.00R.

Puckette, Charles M.; and Butler, Walter J., to General Electric Company. Bucket brigade transversal filter. 3,973,138, Cl. 307-221.00D.

Puckette, Charles McD., to General Electric Company. Adaptive hybrid circuit. 3,973,089, Cl. 179-170.0NC.

Pudark, Arthur A.: *See—*
Zahradnik, George J.; Pudark, Arthur A.; and Turner, Carl L., 3,972,461.

Purvinsh, Indulis Valdovich: *See—*
Pormale, Milda Yanovna; Kashkina, Nadezhda Alexandrovna; Veinberg, Elfrida Indrikovna; Kalninsh, Arvid Yanovich; Shusters, Janis; Mikazhans, Valdis Danielovich; Purvinsh, Indulis Valdovich; and Skutelis, Antons Petrovich, 3,973,007.

Puster, Louis M.; and Price, Larry V., to Robertshaw Controls Company. Gage construction and parts therefor or the like. 3,972,239, Cl. 73-431.000.

Putch, Samuel W., to Nelson, Norman A., a part interest. Locking assembly and a seal assembly for a well. 3,972,546, Cl. 285-18.000.

Pyles, Gerald Dee, to RCA Corporation. Tape cartridge player mechanism. 3,973,178, Cl. 318-673.000.

Q Corporation: *See—*
Albert, Eugene V., Jr., 3,972,262.

Quasar Electronics Corporation: *See—*
Mueller, David J.; and Bonney, Hugh F., 3,973,228.

Quist, Thomas: *See—*
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Quitmann, Walter: *See—*
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R. Melzer oHG Machinenbau und Metallverarbeitung: *See—*
Melzer, Roland, 3,972,519.

Raber, Ervin T., to Leeds & Northrup Company. Thermocouple circuit detector for simultaneous analog trend recording and analog to digital conversion. 3,973,184, Cl. 324-51.000.

Rabl, Carl-Roland; Rigler, Rudolf; Jovin, Thomas J.; Brundl, Hermann; and Simm, Wolfgang, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Apparatus for investigating fast chemical reactions by optical detection. 3,972,627, Cl. 356-246.000.

Raceway Components, Inc.: *See—*
Kohaut, John E., 3,972,579.

Radaci, Gerald S.: *See—*
Gouye, Emmanuel V.; and Radaci, Gerald S., 3,972,781.

Radian Corporation: *See—*
Lowell, Philip S., 3,972,980.

Radiometer A/S: *See—*
Johansen, Ebbe; and Lundsgaard, Finn Chresten, 3,972,614.

Radtke, Volker: *See—*
Bruenemann, Hilmar; Stoeckelmann, Guenter; and Radtke, Volker, 3,972,849.

Raether, Wolfgang: *See—*
Winkelmann, Erhardt; and Raether, Wolfgang, 3,973,019.

Rainer, Wolfgang: *See—*
Dickopp, Gerhard; Jahnel, Benno; Rainer, Wolfgang; and Dummen, Paul Ludwig, 3,973,080.

Raleigh Industries Limited: *See—*
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Raley, Frederick O.: *See—*
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Ralph Electric Plants, Inc.: *See—*
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Rando Machine Corporation: *See—*
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Rapino, Norman G.: *See—*
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Rapisarda, Anthony A.: *See—*
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Rawcliffe, Gordon Hindle: *See—*
Broadway, Alexander Richard William; Fong, William; and Rawcliffe, Gordon Hindle, 3,973,154.

Ray, Daniel F. Apparatus for moving and self-feeding of large haystacks. 3,972,308, Cl. 119-60.000.

Ray Oil Burner Co.: *See—*
Schuitemaker, Theodore; and Plass, Raymond B., 3,972,351.

Razdan, Raj Kumar: *See—*
Harris, Louis Selig; Pars, Harry George; Razdan, Raj Kumar; and Sheehan, John Clark, 3,972,880.

RCA Corporation: *See—*
Ahmed, Adel Abdel Aziz, 3,973,215.
Channin, Donald Jones; and Priestley, Eldon Bruce, 3,973,057.
Conlon, Edward James; DeStephanis, Ralph; and Hitch, Thomas Tipton, 3,972,463.
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Hanson, Richard Eric; and Fordyce, William Fulmer, 3,972,230.
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Redifon Limited: *See—*
Lobb, Daniel Richard, 3,972,583.
Lobb, Daniel Richard, 3,972,584.

Redington, Rowland W.; and Henkes, John L., Jr., to General Electric Company. Mammography. 3,973,126, Cl. 250-444.000.

Reed, David A., to Harris Corporation. Bindery system capable of testing its own inspection and control devices. 3,972,521, Cl. 270-58.000.

Reed, Henry W. Self loading and carrying apparatus. 3,972,433, Cl. 214-450.000.
Reed Industries, Inc.: *See—*
Schmitt, Donald E., 3,972,338.
Reed Irrigation Systems: *See—*
Mock, Donald E., 3,972,165.
Reemers, Joseph: *See—*
Hagen, Siegfried Hendrik; van Osenbruggen, Cornelis; Anton, Herman; Reemers, Joseph; and Verspui, Gerrit, 3,972,797.
Reid, Francis R., to Pillsbury Company, The. Refrigerated dough can. 3,972,468, Cl. 229-51.0BP.
Reider, Alois, to AGFA-Gevaert, A.G. Analog/digital control arrangement for photographic apparatus. 3,972,607, Cl. 353-101.000.
Renes, Hendrik; and Bremer, Joannes Gregorius, to U.S. Philips Corporation. Device for determining the displacement of a machine tool component. 3,973,119, Cl. 250-231.00R.
Renschen, Patrick D., to Brush Wellman, Inc. Copper base alloys. 3,972,712, Cl. 75-157.500.
Repay, Laszlo N.; and Young, Thomas A., to Tenna Corporation. Electrically adjustable vehicle rear view mirror. 3,972,597, Cl. 350-289.000.
Research Corporation: *See—*
Vieth, Wolf R.; Wang, Shaw S.; and Saini, Rakesh, 3,972,776.
Reynolds, Charles Edward; and Swartz, John Clinton, to AMP Incorporated. Electrical contact terminal having improved wire-receiving slot. 3,972,578, Cl. 339-15.000.
Reynolds, Richard L., to Litton Fastening Systems. Fastener manufacturing method. 3,972,084, Cl. 10-10.00R.
Reynolds, William B. Single point threading attachment with lead-screw rotational timing means. 3,972,250, Cl. 82-5.000.
Rheinfelder, William A., to Alpha Engineering Corporation. Circuit to achieve low noise figure. 3,973,214, Cl. 330-31.000.
Rhodes, William A. Silver detecting formulation. 3,972,827, Cl. 252-408.000.
Rhone-Poulenc S.A.: *See—*
Bargain, Michel, 3,972,960.
Rhone-Poulenc-Textile: *See—*
Barbe, Gerard; Habault, Robert; and Tamet, Jean-Louis, 3,973,073.
Richard, Wilton. Culinary articles and apparatus for retrieving and/or sorting the same. 3,972,118, Cl. 30-296.00A.
Richardson Company, The: *See—*
Eppensteiner, Frederick W.; and DeChristopher, Phillip J., 3,972,789.
Sullivan, Robert D.; and Jutte, Gottfried W., 3,972,737.
Richardson, William S., to United States of America, Navy. Method for measuring velocity and direction of currents in a body of water. 3,972,231, Cl. 73-170.00A.
Ridlehuber, Jim M.: *See—*
Gardner, Homer K., Jr.; Hron, Robert J., Sr.; Vix, Henry L. E.; and Ridlehuber, Jim M., 3,972,861.
Riebel, Hans-Jochem: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Behrenz, Wolfgang; Hammann, Ingeborg; and Stendel, Wilhelm, 3,973,013.
Riehl, Fred, to Robertshaw Controls Company. Apparatus for making the inlet end of a tubular burner construction. 3,972,219, Cl. 72-416.000.
Rigby, Sidney J.: *See—*
Iten, Clemens A.; and Rigby, Sidney J., 3,972,417.
Rightmer, Kenneth Carol: *See—*
Laemmle, George Joseph; and Rightmer, Kenneth Carol, 3,972,948.
Rigler, Rudolf: *See—*
Rabl, Carl-Roland; Rigler, Rudolf; Jovin, Thomas J.; Brundl, Hermann; and Simm, Wolfgang, 3,972,627.
Riker Laboratories, Inc.: *See—*
Moore, George G. I.; and Harrington, Joseph Kenneth, 3,972,926.
Ringer, Thomas R., to Canadian Patents and Development Limited. Apparatus for producing snow deflecting air curtains for railway switches. 3,972,497, Cl. 246-428.000.
Rio, Arturo; Cerrone, Marcello; and Saini, Alberto. Manufacture of cement-resin composite articles. 3,972,969, Cl. 264-42.000.
Riseman, Jacob, to International Business Machines Corporation. Method for forming dielectric isolation in integrated circuits. 3,972,754, Cl. 148-175.000.
Rist's Wires & Cables Limited: *See—*
Pemberton, Donald Stuart; and Smith, Gordon Roy Frank, 3,972,580.
Rivinius, Inc.: *See—*
MacDonald, Raymore D., 3,972,406.
Robert Bosch G.m.b.H.: *See—*
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Bosch, Paul; and Tittmann, Egon, 3,972,659.
Dupont, Roger; Eckert, Konrad; Knapp, Heinrich; and Wessel, Wolf, 3,972,314.
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Puster, Louis M.; and Price, Larry V., 3,972,239.
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Robinson, Gene C., to Ethyl Corporation. Diels-Alder type process involving a geminal-dihalocyclopropane and a dienophile. 3,972,901, Cl. 260-346.300.
Robinson, Norman: *See—*
Harper, Douglas Charles; Robinson, Norman; and Janikowski, Stanislaw Maria, 3,972,981.
Rockwell International Corporation: *See—*
Walloch, Wesley F., 3,973,212.
Rockwell, Philip K.; and Liffick, Glenn L., to United States of America, Navy. Multi-size socket wrench. 3,972,253, Cl. 81-91.00C.
Rockwell-Rimoldi S.p.A.: *See—*
Marforio, Nerino, 3,972,296.
Rockwood, Stephen D.; Stapleton, Robert E.; and Stratton, Thomas F., to United States of America, Energy Research and Development Administration. Compact, high energy gas laser. 3,973,213, Cl. 330-4.300.
Rode, France; and Slutz, Eric A., to Hewlett-Packard Company. Circulating shift register time-keeping circuit. 3,973,110, Cl. 235-152.000.
Roemmers Sociedad Anonima Industrial, Comercial y Financiera: *See—*
Ferrari, Pier Nello, 3,973,027.
Rohde, Wolfgang, to Bergwerksverband GmbH. Drag-chain conveyor construction. 3,972,415, Cl. 198-205.000.
Rohe, Lothar: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Behrenz, Wolfgang; Hammann, Ingeborg; and Stendel, Wilhelm, 3,973,013.
Rohsler, Ivor Carl, to Joseph Lucas (Industries) Limited. Control circuits for electrically driven vehicles. 3,973,176, Cl. 318-269.000.
Roland Offsetmaschinenfabrik Faber & Schleicher AG: *See—*
Brandes, Harry, 3,972,523.
Despot, Janko; and Simeth, Claus, 3,972,524.
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Rolls-Royce (1971) Limited: *See—*
Bird, Jack Raymond, 3,972,662.
Romankiw, Lubomyr T.; Slusarczuk, Marko M. G.; and Thompson, David A., to International Business Machines Corporation. Ferrofluid display device. 3,972,595, Cl. 350-267.000.
Ronchinsky, Stanley: *See—*
Corcoran, Boyd L.; and Ronchinsky, Stanley, 3,973,174.
Roos, Sven: *See—*
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Rosch, Gunter: *See—*
Schinzel, Erich; Sahm, Wilfried; and Rosch, Gunter, 3,972,877.
Roseen, Rutger Arvid, to Aktiebolaget Atomenergi. Method of joining components made of cross-linked polymers. 3,972,548, Cl. 285-381.000.
Rosen, Harry, to American Home Products Corporation. Hyperglycemia therapy II. 3,973,029, Cl. 424-273.000.
Rosenberg-Bischoff, M.: *See—*
Montrose, Bjorne Thorwald, 3,972,562.
Rosenberg, David M.; and Stearley, John W., to Robertshaw Controls Company. Control device having locking selector means. 3,973,097, Cl. 200-153.00L.
Rosenberg, Eugene. Antibiotic TA. 3,973,005, Cl. 424-115.000.
Rosenberger, Michael; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Aryl ketals of polycyclic oxo compounds and processes. 3,972,896, Cl. 260-340.500.
Ross, Henry M. Meat slicer. 3,972,256, Cl. 83-155.000.
Ross, Michael F., to Wilkinson Sword Limited. Safety razors. 3,972,115, Cl. 30-59.000.
Rossberger, Erwin: *See—*
Frohler, Hanns; and Rossberger, Erwin, 3,972,796.
Roth, Thomas M., Jr.: *See—*
Smith, Alexander M., II; Adkins, Allen H.; and Roth, Thomas M., Jr., 3,973,066.
Rothmayr, Willy: *See—*
Kleeman, Thomas; and Rothmayr, Willy, 3,972,809.
Rountree, Calvin Briggs; and Mitchell, Donovan Charles Philpin. Slit impact air sampler. 3,972,226, Cl. 73-28.000.
Rowe, Anthony William, to Dreamland Electrical Appliances Limited. Apparatus for detecting changes in the electrical characteristics of sensor devices. 3,973,257, Cl. 340-418.000.
Ruben, Paul Lewis, to Eastman Kodak Company. Zoom projection lens. 3,972,592, Cl. 350-184.000.
Rudy, Jerome; and Rapisarda, Anthony A., to Lever Brothers Company. Additives for clothes dryers. 3,972,131, Cl. 34-60.000.
Rufer, Willy: *See—*
Giddey, Claude; and Rufer, Willy, 3,973,044.
Ruig, Kees, to Stork Amsterdam B.V. Method for sterilizing and pasteurizing container packed products. 3,972,679, Cl. 21-56.000.
Rupprecht, Manfred: *See—*
Klein, Hans Joachim; Rupprecht, Manfred; Wonneberg, Heinz; and Geiger, Julius, 3,972,624.
Ryan, Kelly P., to Blair Manufacturing Company. Hay stack disintegrating apparatus. 3,972,484, Cl. 241-154.000.
Rybicki, Robert Charles: *See—*
Ferris, Donald Leroy; and Rybicki, Robert Charles, 3,972,491.
S.A.E.S. Getters S.p.A.: *See—*
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S.I.A.T. - Societa' Internazionale Applicazioni Tecniche S.p.A.: *See—*
Lissoni, Adelio, 3,972,769.
Saffold, Robert. Rack for bicycles. 3,972,456, Cl. 224-42.03B.

Sagami Chemical Research Center: *See—*
Isowa, Yoshikazu; Nagasawa, Takeshi; Kuroiwa, Katsumasa; and Narita, Koichi, 3,972,773.
Uehara, Hiromichi; Tanimoto, Mitsutoshi; and Ijuin, Yasuharu, 3,973,186.

Sahlin, Thorbjorn: *See—*
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Sahm, Wilfried: *See—*
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Saini, Alberto: *See—*
Rio, Arturo; Cerrone, Marcello; and Saini, Alberto, 3,972,969.

Saini, Rakesh: *See—*
Vieth, Wolf R.; Wang, Shaw S.; and Saini, Rakesh, 3,972,776.

Saito, Hitoshi: *See—*
Shimomura, Taizo; Saito, Hitoshi; Sueyoshi, Minoru; and Tsuda, Hiroshi, 3,972,166.

Saito, Takashi: *See—*
Tanaka, Hiroshi; and Saito, Takashi, 3,972,611.

Saito, Takemi; and Itoya, Shoji, to Fuji Photo Optical Co., Ltd. Position adjusting device for image pickup tube coil assembly. 3,973,231, Cl. 335-210.000.

Sakurai, Yasuhiko: *See—*
Kato, Minoru; and Sakurai, Yasuhiko, 3,973,238.

Salem Tool Company, The: *See—*
Deeter, Ronald C.; and Pozniko, John, 3,972,375.

Sallmann, Alfred: *See—*
Haas, Georges; and Sallmann, Alfred, 3,973,024.

Salvi, Enrico, to General Electric Company. Fuel injection apparatus. 3,972,182, Cl. 60-39.74R.

Sams, Bernard, to Norprint Limited. Adjustable print-out selection mechanisms. 3,972,281, Cl. 101-110.000.

Sandfort, Robert M.: *See—*
Minnick, Robert C.; Bailey, Paul T.; Sandfort, Robert M.; and Semon, Warren L., 3,973,248.

Sandvik Aktiebolag: *See—*
Ericson, Lars Torsten; Ljungstrom, Lars Gosta; and Widmark, Gustaf Henrik, 3,972,108.

Sanelemente, Amaury, to Phillips Petroleum Company. Reduction of deposits in carbon black reactors. 3,972,985, Cl. 423-450.000.

Sangster, Paul B. Well controller and monitor. 3,972,648, Cl. 417-12.000.

Sanitary Scale Company: *See—*
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Sanne, Walter: *See—*
Pommer, Ernst-Heinrich; Kradel, Juergen; Koenig, Karl-Heinz; and Sanne, Walter, 3,973,018.

Sanyo Chemical Industries, Ltd.: *See—*
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Valdettaro, Alarico A., 3,972,241.
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Sasaki, Takashi; and Watanabe, Masayuki, to Yamamura Glass Kabushiki Kaisha. Safety glass container. 3,972,435, Cl. 215-12.00R.

Sasano, Tetsuro: *See—*
Yano, Tsuyoshi; Take, Takao; Nakahara, Kentaro; and Sasano, Tetsuro, 3,972,972.

Sasena, John J., to Eaton Corporation. Method of fence construction. 3,972,110, Cl. 29-452.000.

Sato, Masamichi, to Xerox Corporation. Imaging system. 3,972,305, Cl. 118-637.000.

Sato, Noriyuki: *See—*
Kubo, Hiroshi; Michibayashi, Tatuya; Seki, Nansho; and Sato, Noriyuki, 3,972,909.

Sato, Teruyuki; and Ii, Motohiko, to Sanyo Chemical Industries, Ltd. Water-insensitive and stable hydraulic fluid compositions. 3,972,822, Cl. 252-78.100.

Saucy, Gabriel: *See—*
Rosenberger, Michael; and Saucy, Gabriel, 3,972,896.

Savard, Guy: *See—*
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Sawaguchi, Yoji; Suzuki, Koichi; and Ogawa, Katsumasa, to Fujitsu Ltd. Article depositing machine. 3,973,237, Cl. 235-61.70B.

Sawaki, Mikio; Iwataki, Isao; Ishikawa, Hisao; Yamada, Shozo; and Yasuda, Yasushi, to Nippon Soda Company Limited. α-Pyrone derivatives. 3,972,899, Cl. 260-343.500.

Sawyer, Patrick Frank, to Girling Limited. Vehicle brake pedal arrangements. 3,972,190, Cl. 60-551.000.

Saxon, Robert: *See—*
Kaizerman, Samuel; and Saxon, Robert, 3,972,857.

Sayles, David C., to United States of America, Army. Accelerated curing method for solid propellants. 3,972,967, Cl. 264-3.00R.

Scarpi, Bruno. Tunnelling and lining machine. 3,972,200, Cl. 61-84.000.

Schakat, Rudi, to O & K Orenstein & Koppel Aktiengesellschaft. Tool for attachment to the dipper arm of an excavator. 3,972,097, Cl. 29-33.00R.

Schaupp, Kurt: *See—*
Balle, Gerhard; Dieterich, Dieter; and Schaupp, Kurt, 3,972,723.

Scheffer, Terry J., to BBC Brown Boveri & Company Limited. Liquid crystal display. 3,972,587, Cl. 350-150.000.

Schenk, Richard, to Stacie Pen Corporation. Writing implement. 3,972,630, Cl. 401-217.000.

Schiessler, Siegfried: *See—*
von Plessen, Helmold; and Schiessler, Siegfried, 3,972,987.

Schindler, Herbert: *See—*
Klantke, Herbert; and Schindler, Herbert, 3,972,303.

Schinzel, Erich; Sahm, Wilfried; and Rosch, Gunter, to Hoechst Aktiengesellschaft. Butadiene derivatives, process for their preparation and their use as optical brighteners. 3,972,877, Cl. 260-240.00R.

Schirmann, Jean-Pierre; and Weiss, Francis, to Produits Chimiques Ugine Kuhlmann. Process for the preparation of symmetrical and unsymmetrical azines and mixtures thereof. 3,972,876, Cl. 260-240.00G.

Schirmann, Jean-Pierre; Combroux, Jean; and Delavarenne, Serge Yvon, to Produits Chimiques Ugine Kuhlmann. Method for preparing azines and hydrazones. 3,972,878, Cl. 260-240.00G.

Schirmann, Jean-Pierre: *See—*
Mathais, Henri; Schirmann, Jean-Pierre; and Weiss, Francis, 3,972,874.

Schliemann, Gerd: *See—*
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Schloemann-Siemag Aktiengesellschaft: *See—*
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Schmidt, Albert S., Sr.: *See—*
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Schmidt, Richard. Axial thrust resisting in-line coupling. 3,972,205, Cl. 64-19.000.

Schmiedel, Sabine: *See—*
Schweig, Dieter; and Schmiedel, Sabine, 3,972,275.

Schmitt, Donald E., to Reed Industries, Inc. Coin changer with dual-slide payout mechanism. 3,972,338, Cl. 133-4.00A.

Schmitt, Jerry C.; and Michie, Terry K., to King Radio Corporation. Weather radar transistorized pulse modulator. 3,973,145, Cl. 307-263.000.

Schmitt, Reimar, to Battelle Memorial Institute. Process for manufacturing a negative accumulator electrode for the reversible storage and restitution of hydrogen. 3,972,726, Cl. 136-20.000.

Schnall, Gunther: *See—*
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Schneiter, Fred E.: *See—*
Kirchoff, George F.; and Schneiter, Fred E., 3,972,545.

Schoenewaldt, Erwin F.: *See—*
Dolling, Ulf-H.; Grabowski, Edward J. J.; Schoenewaldt, Erwin F.; and Sletzinger, Meyer, 3,972,921.

Schottey, Jean: *See—*
Plumat, Emile; Schottey, Jean; and Toussaint, Francois, 3,973,069.

Schreiber, Peter, to U.S. Philips Corporation. Anode disc for an X-ray tube comprising a rotary anode. 3,973,156, Cl. 313-330.000.

Schretter, Stanley J.: *See—*
Costantini, Ralph J.; Parsons, Charles R.; and Schretter, Stanley J., 3,973,260.

Schrock, Wilfried: *See—*
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Konig, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl-Georg, 3,972,870.

Schroder, Dieter K.; and Wickstrom, Robert A., to Westinghouse Electric Corporation. Charge storage target and method of manufacture. 3,973,270, Cl. 357-31.000.

Schroeder, Mark Joseph: *See—*
Fosberg, Michael Allen; Lancaster, James Wallace; Schroeder, Mark Joseph; and Plunkett, Jerry D., 3,972,826.

Schubert & Salzer Maschinenfabrik Aktiengesellschaft: *See—*
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Schuil, Roelof Egbert: *See—*
Geenen, Constant Joseph Maria; and Schuil, Roelof Egbert, 3,973,160.

Schuitemaker, Theodore; and Plass, Raymond B., to Ray Oil Burner Co. Viscosity compensating oil burner control system. 3,972,351, Cl. 137-625.470.

Schuler, Michael; and Thyen, Eberhard H., to Ethicon, Inc. Molded suture package. 3,972,418, Cl. 206-63.300.

Schumacher, Bernd: *See—*
Ullmann, Werner; Ferroni, Bernardo; and Schumacher, Bernd, 3,973,104.

Schummer, Hans: *See—*
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Schupp, Lewis J., to General Electric Company. Photoflash lamp. 3,972,673, Cl. 431-95.00R.

Schwab, Frederick C.; and Murray, James G., to Mobil Oil Corporation. Organic reinforcing fillers for rubber. 3,972,963, Cl. 260-880.00B.

Schwank, Max, to Ciba-Geigy AG. Process for dyeing skins and furs. 3,972,675, Cl. 8-10.000.

Schwartz, Robert C. Floating collar for boats. 3,972,082, Cl. 9-14.000.

Schwarze, Walter G.: *See—*
de Lissa, Richard C. F.; and Schwarze, Walter G., 3,973,074.

Schweig, Dieter; and Schmiedel, Sabine, to Siemens Elektrogerate GmbH. Method and apparatus for roasting meat. 3,972,275, Cl. 99-326.000.

Schwelberger, Hubert: *See—*
Sigott, Siegfried; Schwelberger, Hubert; Obermaier, Herbert; and Zitz, Alfred, 3,972,429.

Schwerdtel, Wulf: *See—*
Halcour, Kurt; Losacker, Paul; Schwerdtel, Wulf; and Swodenk, Wolfgang. 3,972,955.
Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang. 3,972,944.

Science Union et Cie: *See—*
Beregi, Laszlo; Hugon, Pierre; Pascaud, Xavier; and Poignant, Jean-Claude. 3,972,994.

SCM Corporation: *See—*
Galusky, Thom B.; and Ilagan, Juan B., Jr., 3,973,053.

Scott, Charles E., to P. R. Mallory & Co., Inc. Control circuit with end of cycle indication. 3,973,135, Cl. 307-141.000.

Scott, Eric J. Y.: *See—*
Gorring, Robert L.; Scott, Eric J. Y.; and Smith, Robert L., 3,972,853.

Scott Paper Company: *See—*
Plumadore, John D., 3,972,613.

Scott, William W., Jr.; and Guth, Charles D., to Lukens Steel Company. Furnace for melting highly corrosive slag. 3,973,076, Cl. 13-35.000.

Searle, Robert J. G.; Woodall, Roger E.; and Bull, Michael J., to Shell Oil Company. Cyanobenzyl cyclopropane carboxylate pesticides. 3,973,035, Cl. 424-304.000.

Sebag, Henri: *See—*
Vanlerberghe, Guy; and Sebag, Henri, 3,972,914.

Sebastian Messerschmidt, Spezialmaschinenfabrik, Firma: *See—*
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Secoura, Ralph James: *See—*
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Seki, Nansho: *See—*
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Sekiguchi, Koichi, to Iwasaki Tsushinki Kabushiki Kaisha. Rotary dial device for a telephone set. 3,973,083, Cl. 179-90.00D.

Sekizawa, Hidekazu: *See—*
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Selleri, Renato: *See—*
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Semon, Warren L.: *See—*
Minnick, Robert C.; Bailey, Paul T.; Sandfort, Robert M.; and Semon, Warren L., 3,973,248.

Sendor, Mortimer S., to Bookwrights, Inc. Plastic book cover and method of making. 3,972,764, Cl. 156-243.000.

Senoura, Masaakira: *See—*
Kodama, Yutaka; Kodama, Tsutomu; Takai, Akira; Senoura, Masaakira; Watanabe, Isao; Tanaka, Katsunori; Yamaguchi, Tomonobu; Abe, Norio; and Kodama, Takuya, 3,972,882.

Seragnoli, Enzo, to G. D. Societa per Azioni. Apparatus for producing understrips for hinge lid cigarette packets. 3,972,271, Cl. 93-58.20R.

Seragnoli, Enzo, to G. D. Societa per Azioni. Device for aligning delicate oblong products, such as chocolates, on a conveyor. 3,972,408, Cl. 198-29.000.

Serkov, Arkady Trofimovich; Sokolovsky, Boris Matveevich; Kalitin, Viktor Alexandrovich; and Shishkina, Nina Petrovna. Apparatus for washing yarn during movement thereof. 3,972,209, Cl. 68-22.00R.

Seruga, Edward A.: *See—*
Pelt, Thomas E.; and Seruga, Edward A., 3,972,233.

Sewell, Gordon J.: *See—*
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SGS-ATES Componenti Elettronici S.p.A.: *See—*
Graziadei, Rinaldo; and Siligoni, Marco, 3,973,180.

Shaffer, Ralph M.; and Patejak, Jerzy F., to Aetna-Standard Engineering Company. Apparatus for diverting pipe to a plurality of beds or the like. 3,972,410, Cl. 198-31.0AC.

Sharp Kabushiki Kaisha: *See—*
Ito, Fukusaburo, 3,972,306.
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Sharps Associates: *See—*
Harris, Louis Selig; Pars, Harry George; Razdan, Raj Kumar; and Sheehan, John Clark, 3,972,880.

Shatalov, Valentin Pavlovich: *See—*
Petrov, Gennady Nikolaevich; Tolstopyatov, Gennady Mikhailovich; Krasilnikov, Sergei Mikhailovich; Juzhakov, Nikolai Alexandrovich; Kornilova, Tatyana Alexeevna; Lashova, Svetlana Mikhailovna; Shatalov, Valentin Pavlovich; Kovtunenko, Leonid Vasillevich; Shteinbok, Alexandr Julievich; Mandelshtam, Elena Yakovlevna; and Korotkevich, Boris Sergeevich, 3,972,863.

Sheehan, John Clark: *See—*
Harris, Louis Selig; Pars, Harry George; Razdan, Raj Kumar; and Sheehan, John Clark, 3,972,880.

Shell Oil Company: *See—*
Kwantes, Arien, 3,972,950.
Searle, Robert J. G.; Woodall, Roger E.; and Bull, Michael J., 3,973,035.
van Os, George, 3,972,690.

Shellow, Robert M.; and Weidner, Urban A., to Mak-Kraft Creations, Inc. Seating unit convertible to a bed. 3,972,079, Cl. 5-18.00R.

Shellow, Robert M.; and Weidner, Urban A., to Mak-Kraft Creations, Inc. Sofa bed. 3,972,080, Cl. 5-38.000.

Sheppard, Isaac, Jr. Saddle hanger. 3,972,169, Cl. 52-702.000.

Sherman, Alan E., to Steven Manufacturing Company. Velocipede presence indicating device. 3,972,302, Cl. 116-28.00R.

Sherwood Refractories, Inc.: *See—*
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Sherwood, Thomas K., to Union Oil Company of California. Method for producing mechanical energy from geothermal brine. 3,972,193, Cl. 60-641.

Shibata, Kazuo; Fukuda, Yoshio; Takada, Michinosuke; and Nakanomyo, Katsuo, to Shimadzu Seisakusho Ltd. Spectrophotometer. 3,972,617, Cl. 356-88.000.

Shiff, Milo B., to Anaconda Company, The. Key telephone system with directly associated station cards and sets. 3,973,085, Cl. 179-99.000.

Shima, Takeo: *See—*
Inata, Hiroo; Kawase, Shoji; and Shima, Takeo, 3,972,852.

Shimadzu Seisakusho Ltd.: *See—*
Shibata, Kazuo; Fukuda, Yoshio; Takada, Michinosuke; and Nakanomyo, Katsuo, 3,972,617.

Shimahara, Hideo: *See—*
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Shimojo, Masayoshi: *See—*
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Shimomura, Taizo; Saito, Hitoshi; Sueyoshi, Minoru; and Tsuda, Hiroshi, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Heat insulation structure for liquefied gas storage tank. 3,972,166, Cl. 52-404.000.

Shinagawa, Susumu: *See—*
Fujino, Masahiko; Shinagawa, Susumu; and Fukuda, Tsunehiko, 3,972,859.

Shinto Paint Co., Ltd.: *See—*
Morosawa, Kaoru; Maruyama, Iwao; Kaneda, Shigemasa; Nishimura, Mitsuo; Taki, Kiyoshi; and Kuninori, Takeshi, 3,972,844.

Shiohara, Katsuaki: *See—*
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Short, Junius. Food server. 3,972,419, Cl. 211-78.000.

Short, Paul Frank, Jr. Air pollution control system. 3,972,697, Cl. 55-242.000.

Shova Denko Kabushiki Kaisha: *See—*
Kubo, Hiroshi; Michibayashi, Tatuya; Seki, Nansho; and Sato, Noriyuki, 3,972,909.

Shteinbok, Alexandr Julievich: *See—*
Petrov, Gennady Nikolaevich; Tolstopyatov, Gennady Mikhailovich; Krasilnikov, Sergei Mikhailovich; Juzhakov, Nikolai Alexandrovich; Kornilova, Tatyana Alexeevna; Lashova, Svetlana Mikhailovna; Shatalov, Valentin Pavlovich; Kovtunenko, Leonid Vasillevich; Shteinbok, Alexandr Julievich; Mandelshtam, Elena Yakovlevna; and Korotkevich, Boris Sergeevich, 3,972,863.

Shusters, Janis: *See—*
Pormale, Milda Yanovna; Kashkina, Nadezhda Alexandrovna; Veinberg, Elfrida Indrikovna; Kalninsh, Arvid Yanovich; Shusters, Janis; Mikazhans, Valdis Danielovich; Purvinsh, Indulis Valdovich; and Skutelis, Antons Petrovich, 3,973,007.

Sickinger, Albert E., to Hans Sickinger Co. Cutting fixture for spiral binders and method of manufacture. 3,972,109, Cl. 29-434.000.

Siddiqui, Iftikhar Hussain: *See—*
Collins, John Desmond; Coates, Harold; and Siddiqui, Iftikhar Hussain, 3,972,908.

Sidorenko, Mikhail Kirillovich; Cherkashin, Jury Ivanovich; and Lopatin, Nikolai Nikolaevich. Refrigerator. 3,972,204, Cl. 62-447.000.

Siegl, Herbert: *See—*
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Siemens Aktiengesellschaft: *See—*
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Klein, Heinrich; and Pieper, Rudolf, 3,972,698.
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Siemens Elektrogerate GmbH: *See—*
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Sigott, Siegfried; Schwelberger, Hubert; Obermaier, Herbert; and Zitz, Alfred, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Dividing cutting machine. 3,972,429, Cl. 214-130.00R.

Sih, Charles J., to Wisconsin Alumni Research Foundation. Dl-strigol intermediate. 3,972,916, Cl. 260-514.00G.

Siligoni, Marco: *See—*
Graziadei, Rinaldo; and Siligoni, Marco, 3,973,180.

Silvestri, George J., Jr., to Westinghouse Electric Corporation. Steam pressure increasing device for drive turbines. 3,972,196, Cl. 60-677.000.

Simeth, Claus, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Chain conveyor for printing presses. 3,972,413, Cl. 198-180.000.

Simeth, Claus: *See—*
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Simm, Wolfgang: *See—*
Rabl, Carl-Roland; Rigler, Rudolf; Jovin, Thomas J.; Brundl, Hermann; and Simm, Wolfgang, 3,972,627.

Simmons, George H. Hanger for attaching items to a chain link type fence. 3,972,499, Cl. 248-224.000.

Simon-Carves Limited: *See—*
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Sinatra, Innocenzio: *See—*
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Singer Company Patent Department, The: *See—*
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Skelly, David W.; and Sewell, Gordon J., to General Electric Company. Nematic liquid crystal mixtures with stable homeotropic boundary conditions and methods of making the same. 3,972,589, Cl. 350-160.0LC.
SKF Compagnie d'Applications Mecaniques: *See—*
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Skidmore, William J., III: *See—*
McMorris, Daniel W.; and Skidmore, William J., III, 3,973,194.
Skinner Precision Industries, Inc.: *See—*
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Sloane, Edwin A., to Time/Data Corporation. System for determining transfer function. 3,973,112, Cl. 235-156.000.
Slomkowski, John J., to Large Scale Readouts, Inc. Device for displaying numbers. 3,972,139, Cl. 40-28.00C.
Slomski, Waclaw Kazimierz. Device to detect hand tremors of various causes. 3,972,132, Cl. 35-22.00R.
Slonaker, Robert O.: *See—*
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Smith, Alexander M., II; Adkins, Allen H.; and Roth, Thomas M., Jr., to Fiberwoven Corporation, The. Electric blanket shell and method of production. 3,973,066, Cl. 428-91.000.
Smith, Bernard Francis, to Aeonic Press Company. Power feeding apparatus. 3,972,449, Cl. 222-64.000.
Smith, Edwin. Couch. 3,972,565, Cl. 297-455.000.
Smith, Gordon Roy Frank: *See—*
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Smith, Randel P., to Singer Company, The. Needle bar pattern shifting device. 3,972,295, Cl. 112-79.00A.
Smith, Richard F., to GAF Corporation. Hydroxybenzylidene iminophenyl-benzothiazoles. 3,972,875, Cl. 260-240.00G.
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Soot, Olaf. Amphibious camper including a retractable suspension system. 3,972,544, Cl. 280-704.000.
Soraya, Sorayapour: *See—*
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Station des Cultures Fruitieres et Maraicheres: *See—*
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Steltz, Irvin J.: *See—*
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Stephans, J. Larry. Timing device for exercise program with signalling means. 3,973,251, Cl. 340-309.100.

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Stern, Harold. Fractionation of proteins by electrical means. 3,972,791, Cl. 204-180.00P.

Stern, Robert G.; and Mitchell, Larry D., to Affiliated Hospital Products, Inc. Bed arrangement. 3,972,081, Cl. 5-68.000.

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Stevens, Kenneth L.; and Jurd, Leonard, to United States of America, Agriculture. Mosquito larvicide. 3,972,897, Cl. 260-340.500.

Stevers, Robert Glenn. Writing instrument support. 3,972,628, Cl. 401-48.000.

Stewart, Ann M.: *See—*
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Stewart, Wilton A.; and Stewart, Ann M. Advancement of film strips of different widths and/or sprocket hole sizes. 3,972,606, Cl. 352-79.000.

Stock, Arthur J.; Christofer, Donald E.; and Brinza, Joseph E., to Stock Equipment Company. Crane apparatus. 3,972,420, Cl. 212-14.000.

Stock Equipment Company: *See—*
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Stoesser, Wolfgang R.; Wills, Connable F.; and Sperling, Irving, to Compucorp. Key detection system interconnecting keyboard and data processing system. 3,973,256, Cl. 340-365.00E.

Stolle Corporation, The: *See—*
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Straujups, John E., to Birch Brothers Southern, Inc. Winding apparatus with roll transfer means and method. 3,972,486, Cl. 242-66.000.

Streckenbach, Wulf-Christian; and Knuth, Kurt, to Licentia Patent-Verwaltungs-G.m.b.H. Information transmission system. 3,973,241, Cl. 340-167.00A.

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Sugiyama, Noboru; and Shimahara, Hideo, to Kabushiki Kaisha Shimizu Manzo Shoten. Konjac mannan. 3,973,008, Cl. 424-195.000.

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Sugizaki, Toshio, to Matsushita Electric Industrial Co., Ltd. Electronic channel selector including control means for selecting a channel and applying power to a load circuit. 3,973,207, Cl. 325-457.000.

Sukurs, Raimonds; and Kemper, Hans, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Reloading device. 3,972,405, Cl. 198-9.000.

Sullivan, Arthur Francis: *See—*
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Sullivan, Robert D.; and Jutte, Gottfried W., to Richardson Company, The. Multi-partitioned thin-walled container. 3,972,737, Cl. 136-166.000.

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Sundberg, Erik G.; and Westberg, Erik, to Aktiebolaget Tudor. Sheath for tubular storage, battery electrodes and method for their production. 3,972,728, Cl. 136-43.000.

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Susi, Peter Vincent; and Oppelt, John Christian, to American Cyanamid Company. Alkylamides of hindered 3,5-dialkyl-4-hydroxybenzoic acids and use as light stabilizers in polyolefins. 3,972,927, Cl. 260-559.00R.

Sutherland, John W. Reversible self-propelled plate compactor. 3,972,637, Cl. 404-133.000.

Sutter, James E. Dental router. 3,972,122, Cl. 32-40.00R.

Suwa, Michiharu, to Canon Kabushiki Kaisha. Greatly variable magnification zoom lens system of large aperture ratio. 3,972,591, Cl. 350-184.000.

Suzuki, Hideaki; Togawa, Haruo; Omori, Akira; and Yamamoto, Naoki, to Teijin Limited. Ion-exchangeable and solvent-resistant filamentary structure containing sulfone cross-linked aromatic units. 3,972,840, Cl. 260-2.10R.

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Swayne, Kenny M., to United Technologies Corporation. Turbine cooling air regulation. 3,972,181, Cl. 60-39.660.

Swift, Harold E.: *See—*
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Szarvasi, Etienne, to Lipha, Lyonnaise Industrielle Pharmaceutique. Compositions and methods for producing a vasodilatory effect with a naphthyl tetrahydrofurfuryl amino-ester. 3,973,033, Cl. 424-285.000.

Tachiyama, Kanjyo, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Device for charging materials into blast furnace. 3,972,426, Cl. 214-35.00R.

Tadewald, Thomas D., to Universal Oil Products Company. Wood veneer radiant heating panel. 3,973,103, Cl. 219-543.000.

Taguchi, Tetsuya: *See—*
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Tai, Masaru. Telephone number indexing device. 3,972,141, Cl. 40-78.000.

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Taiyu Doro Kensetsu Kabushiki Kaisha: *See*—
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Takagi, Toshio, to Tokyo Denryoku Kabushiki Kaisha. Electric power system supervisory control system comprising A/D converters at various points of the power system. 3,972,470, Cl. 235-151.210.
Takahashi, Koichi: *See*—
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Takai, Akira: *See*—
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Takayama, Katsuki; and Adachi, Yoshiharu, to Aisin Seiki Kabushiki Kaisha. Hydraulic brake system with automatic brake means for vehicles. 3,972,382, Cl. 180-98.000.
Take, Takao: *See*—
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Tanaka, Akio, to Zenith Radio Corporation. Television tuning system indicator. 3,973,205, Cl. 325-455.000.
Tanaka, Hiroshi; and Saito, Takashi, to Canon Kabushiki Kaisha. Apparatus for transferring images produced by liquid developer. 3,972,611, Cl. 355-10.000.
Tanaka, Katsunori: *See*—
Kodama, Yutaka; Kodama, Tsutomu; Takai, Akira; Senoura, Masaakira; Watanabe, Isao; Tanaka, Katsunori; Yamaguchi, Tomonobu; Abe, Norio; and Kodama, Takuya, 3,972,882.
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Tang, Chung L.; and Telle, John Martin, to Cornell Research Foundation, Inc. Very rapidly tuned cw dye laser. 3,973,219, Cl. 331-94.50C.
Tanigawa, Mikiya: *See*—
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Taniguchi, Kanazu, to Toko Incorporated. Method and apparatus for packaging electronic components with thermosetting material. 3,972,663, Cl. 425-125.000.
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Taylor, Julian S.; and Birdsong, Dwight C. Apparatus for removing solids from drilling mud. 3,972,799, Cl. 204-300.00R.
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Technicolor Corporation: *See*—
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Dickopp, Gerhard; Jahnel, Benno; Rainer, Wolfgang; and Dummen, Paul Ludwig, 3,973,080.
Teel, Kalle, to Environmental Elements Corporation. Electrostatic precipitator having electrode stabilizer means. 3,972,701, Cl. 55-146.000.
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Vieth, Wolf R.; Wang, Shaw S.; and Saini, Rakesh, to Research Corporation. Preparation of protein membranes containing microbial cells. 3,972,776, Cl. 195-65.000.

Vinas, Juan, to Vinatex Knitting Systems, Inc. Selection device for the needles of a knitting machine. 3,972,207, Cl. 66-50.00R.

Vinatex Knitting Systems, Inc.: *See—*
Vinas, Juan, 3,972,207.

Vivoli, Marcello, to Arte Vetrina s.r.l. System in which a number of structural members are used to form compound structures, particularly structures for furnishings. 3,972,638, Cl. 403-174.000.

Vix, Henry L. E.: *See—*
Gardner, Homer K., Jr.; Hron, Robert J., Sr.; Vix, Henry L. E.; and Ridlehuber, Jim M., 3,972,861.

Vogeli, Ernst, to Polio Establishment Vaduz. Wall system of two parallel spaced panels. 3,972,167, Cl. 52-481.000.

Voges, Dieter; Hupfer, Leopold; Winderl, Siegfried; Leonhard, Karl Wilhelm; and Hoffmann, Herwig, to BASF Aktiengesellschaft. Manufacture of hexamethylene diamine. 3,972,938, Cl. 260-583.00K.

Voitsekhovsky, Bogdan Vyacheslavovich; and Dolgov, Anatoly Vladimirovich. Centrifuge for the refining of nonferrous metals. 3,972,514, Cl. 266-204.000.

Vollmann, Hansjorg: *See—*
von der Eltz, Hans-Ulrich; Gunther, Dieter; Krell, Karl-Heinz; Matterstock, Karl; and Vollmann, Hansjorg, 3,972,904.

Volynsky, Alexandr Semenovich; Prokofiev, Mikhail Ivanovich; and Kryachkova, Aida Pavlovna. Method of producing follicle-stimulating hormone. 3,973,004, Cl. 424-108.000.

von Bebenburg, Walter; and Offermanns, Heribert, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Certain pyrido[3,2-e][1,4-diazepinones and derivatives. 3,972,873, Cl. 260-239.30B.

von der Eltz, Hans-Ulrich; Gunther, Dieter; Krell, Karl-Heinz; Matterstock, Karl; and Vollmann, Hansjorg, to Hoechst Aktiengesellschaft. Water-soluble dyestuffs readily convertible into insoluble form and process for preparing them. 3,972,904, Cl. 260-372.000.

von Plessen, Helmold; and Schiessler, Siegfried, to Hoechst Aktiengesellschaft. Process for regenerating sulfuric acid. 3,972,987, Cl. 423-523.000.

von Strandtmann, Maximilian: *See—*
Connor, David T.; Young, Patricia A.; and von Strandtmann, Maximilian, 3,973,020.

Vuilleumier, Cyril, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Control mechanism for time setting and similar functions. 3,972,177, Cl. 58-63.000.

VVU Zavodu vseobecneho strojirenstvi: *See—*
Mureso, Vladimir, 3,972,206.

W. B. Van Nest Company: *See—*
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W. R. Grace & Co.: *See—*
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Wahlsten, Gunnar: *See—*
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Wakim, Paul E. Surgical shield. 3,972,332, Cl. 128-303.00R.

Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, to Bayer Aktiengesellschaft. Process for preparing aldehydes from olefins. 3,972,944, Cl. 260-599.000.

Waleckx, Jean, to SKF Compagnie d'Applications Mecaniques. Spinning rotor construction. 3,972,172, Cl. 57-58.890.

Waleij, Ivar: *See—*
Grundstrom, Erik Hilding; Grundstrom, Gote Einar; and Waleij, Ivar, 3,972,294.

Walker, Brooks. Exhaust gas recirculation control by high port actuated diaphragm. 3,972,312, Cl. 123-119.00A.

Wallace, Harry L., to Burroughs Corporation. Document view station. 3,972,522, Cl. 271-64.000.

Wallace, Thomas John: *See—*
McCracken, Leonard Dean; and Wallace, Thomas John, 3,972,528.

Walloch, Wesley F., to Rockwell International Corporation. Phase detection in phase lock loop circuit. 3,973,212, Cl. 329-122.000.

Walsh, David I.; and Casey, James P., to Microfibres, Inc. Synthetic suede. 3,973,065, Cl. 428-89.000.

Walter, Arthur, to Erwin Sick Optik-Elektronik. Reading device for optically detectable digital codes. 3,973,107, Cl. 235-61.11E.

Walters, John P.; and Bernier, John A., to Wisconsin Alumni Research Foundation; and Fisher Scientific Company. Spark sources with electronic switching tubes. 3,973,167, Cl. 315-207.000.

Walters, Tom. Containers. 3,972,450, Cl. 222-91.000.

Wang, Shaw S.: *See—*
Vieth, Wolf R.; Wang, Shaw S.; and Saini, Rakesh, 3,972,776.

Wang, Teh Po: *See—*
Starr, Carrol Dean; and Wang, Teh Po, 3,972,740.

Warburton, Donald L.: *See—*
Bowers, Frederic M.; Ambrus, Judith H.; Briggs, George S.; DeGraba, Michael E.; Green, Gary L.; Kushner, Allan S.; and Warburton, Donald L., 3,972,730.

Ward, Terence James, to John Wyeth and Brother Limited. 1,4-Dihydro-3,5-pyridine dicarbonitrile derivatives. 3,973,025, Cl. 424-263.000.

Warn Industries, Inc.: *See—*
Wright, Allen J., 3,972,633.

Warner, Dale J.; and Wahl, Edward C., to Gits Brothers Manufacturing Co. Rotating shaft seal assembly. 3,972,536, Cl. 277-83.000.

Warner-Lambert Company: *See—*
Connor, David T.; Young, Patricia A.; and von Strandtmann, Maximilian, 3,973,020.
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Warner & Swasey Company, The: *See—*
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McClelland, Alex J., 3,972,537.

Warren, Donald K., to Phillips Petroleum Company. Meter housing. 3,972,440, Cl. 220-18.000.

Warren, Joel A., to Ethyl Corporation. Catalytic treatment of exhaust gas responsive to engine temperature. 3,972,184, Cl. 60-288.000.

Warren, Roger W.; and Feldman, Donald W., to Westinghouse Electric Corporation. Incandescent source of visible radiations. 3,973,155, Cl. 313-218.000.

Washbourne, Colin, to Foesco International Limited. Catalyst carriers. 3,972,834, Cl. 252-455.00R.

Washizuka, Isamu; Hashimoto, Shintaro; and Matsui, Hirotoshi, to Sharp Kabushiki Kaisha. Calculator having thermal printing head. 3,973,111, Cl. 235-156.000.

Watanabe, Isao: *See—*
Kodama, Yutaka; Kodama, Tsutomu; Takai, Akira; Senoura, Masaakira; Watanabe, Isao; Tanaka, Katsunori; Yamaguchi, Tomonobu; Abe, Norio; and Kodama, Takuya, 3,972,882.

Watanabe, Katsujiro: *See—*
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Watanabe, Masayuki: *See—*
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Watts, Max Welton, to Aid Corporation, The. Switch for a railroad transportation system employing a rotating drive shaft. 3,972,293, Cl. 104-130.000.

Weatherhead Company, The: *See—*
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Webb, John M.: *See—*
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Webb, William E.: *See—*
Van Alstine, Cyle; and Webb, William E., 3,972,403.

Weber, Edwin Joseph; and Secoura, Ralph James, to Black and Decker Manufacturing Company, The. Modular cordless tools. 3,973,179, Cl. 320-2.000.

Weber, Guy; and Kim, Quang Pham, to La Cellophane. Method for electrostatic reproduction by charge transfer. 3,972,714, Cl. 96-1.0TE.

Weber, Robert E., to Kimberly-Clark Corporation. Soft, nonwoven web having high intensity and low intensity bonds and a lubricant on the surfaces of the synthetic filaments comprising said. 3,973,068, Cl. 428-198.000.

Wehrli, Pius Anton: *See—*
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Weidenbenner, William A.; and Steltz, Irvin J., to Amchem Products, Inc. Heat transfer composition and method of making. 3,972,821, Cl. 252-75.000.

Weidner, Urban A.: *See—*
Shellow, Robert M.; and Weidner, Urban A., 3,972,079.
Shellow, Robert M.; and Weidner, Urban A., 3,972,080.

Weier, Richard M.: *See—*
Karim, Aziz; Marsheck, William J.; and Weier, Richard M., 3,972,871.

Weigel, Morton L., to Sarkes Tarzian, Inc. Combined 82-position UHF and VHF television tuner with memory fine tuning. 3,973,229, Cl. 334-86.000.

Weigl, John W., to Xerox Corporation. Electrostatographic gravure member. 3,972,718, Cl. 96-1.500.

Weinstock, Leonard M.; Karady, Sandor; and Sletzinger, Meyer, to Merck & Co., Inc. Process for the preparation of chloromethyl methyl ether. 3,972,947, Cl. 260-614.00R.

Weinstock, Manuel; and Pisano, Frank T., to United States of America, Army. Rocket catapult apparatus. 3,972,261, Cl. 89-1.813.

Weiss, Francis: *See—*
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Schirmann, Jean-Pierre; and Weiss, Francis, 3,972,876.

Welsh, Bruce T.: *See—*
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Welsh, Harold H., Jr., to Bendix Corporation, The. Flow control valve means for a servomotor. 3,972,263, Cl. 91-6.000.

Welsh, William Charles, to Weltap Limited. Dispenser closure. 3,972,452, Cl. 222-501.000.

Weltap Limited: *See—*
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Werner, Charles E.: *See—*
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Wessel, Wolf: *See—*
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West, Vallie D.; and Kennedy, Jesse. Machine for changing giant tires. 3,972,363, Cl. 157-1.260.
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Western Electric Company, Inc.: *See—*
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Westinghouse Electric Corporation: *See—*
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Fort, Emil M.; Kaczmsrek, Thomas D.; and Phillips, David C., 3,972,225.
Schroder, Dieter K.; and Wickstrom, Robert A., 3,973,270.
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Whalen, John J., Jr. Marking devices. 3,972,629, Cl. 401-199.000.
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Wheless, William B., to Midland-Ross Corporation. Shutoff and exhaust valve for air brakes. 3,972,341, Cl. 137-102.000.
Whillock, Allan A.; and Yount, James Wesley, to International Paper Company. Paper-board laminate. 3,972,467, Cl. 229-14.0BL.
Whirlpool Corporation: *See—*
Mason, Anthony, 3,972,130.
White, Mayfield C. Chair and table combination. 3,972,560, Cl. 297-145.000.
White, Wilmer: *See—*
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Whiteside, Arliss Eugene; and Hornbuckle, John Aubrey, to Bendix Corporation, The. Digital image processor. 3,973,243, Cl. 340-172.500.
Whitney, Clyde Raymond: *See—*
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Whitten, George R., Jr. Swimming pool rope anchor. 3,972,077, Cl. 4-172.000.
Wickens, James Charles: *See—*
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Wickham, Geoffrey Gordon, to Telectronics Pty. Limited. Demand heart pacer with dual time bases. 3,972,334, Cl. 128-419.0PG.
Wickstrom, Robert A.: *See—*
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Widdig, Arno; Urbschat, Ewald, deceased (by Urbschat, Gertrud Emma Maria Gerda, heiress); Grewe, Ferdinand; and Kaspers, Helmut, to Bayer Aktiengesellschaft. Quinonemonoximearylacylhydrazones. 3,972,905, Cl. 260-396.00N.
Widmark, Gustaf Henrik: *See—*
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Widmer, Walter, to U.S. Philips Corporation. Prediction differential pulse code modulation system with adaptive compounding. 3,973,199, Cl. 325-38.00B.
Wiedemann, Wolfgang, to Hoechst Aktiengesellschaft. Electrophotographic recording material. 3,972,717, Cl. 96-1.500.
Wiesner, Paul; Wohler, Fritz; and Stonner, Hans-Martin, to Metallgesellschaft Aktiengesellschaft. Process for the treatment of phenol-containing waste water from coal degassing or gasification processes. 3,972,693, Cl. 55-42.000.
Wilbur B. Driver Company: *See—*
Starr, Carrol Dean; and Wang, Teh Po, 3,972,740.
Wild, Hermann, to J. G. Anschutz GmbH. Weapon for target competition. 3,972,143, Cl. 42-75.00A.
Wildt Mellor Bromley Limited: *See—*
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Wilhelm, Frederick C., to Universal Oil Products Company. Hydrocarbon conversion with an acidic, sulfur-free trimetallic catalytic composite. 3,972,805, Cl. 208-139.000.
Wilke, Charles R.; and Mitra, Gautam, to United States of America, Energy Research and Development Administration. Conversion of cellulosic materials to sugar. 3,972,775, Cl. 195-33.000.
Wilke, Norbert: *See—*
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Williams, Frederick R.; and Aylesworth, Robert D., to Emery Industries, Inc. Non-migrating polymeric plasticizers for polyvinyl chloride. 3,972,962, Cl. 260-873.000.
Williams Instrument, Inc.: *See—*
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Williams, Jillian A.; and James, Ronald, to Wilkinson Sword Limited. Pressurized dispensers. 3,972,446, Cl. 222-3.000.
Williams, Robert A.; and Holt, David M., to Williams Instrument, Inc. Current potential indicator. 3,973,195, Cl. 324-72.500.
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Winkelmann, Erhardt; and Raether, Wolfgang, to Hoechst Aktiengesellschaft. Pharmaceutical compositions containing 1,4-bis-(5'-nitroimidazolyl-2'-methylene-imino) piperazine compounds for treating protozoal diseases and methods for treating such diseases. 3,973,019, Cl. 424-250.000.
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Witte, Johan Frederik, to Stork Amsterdam B.V. Apparatus for treating finely divided materials with gaseous fluid. 3,972,278, Cl. 99-451.000.
Wohler, Fritz: *See—*
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Wolf, Charles B.; and Blazer, Donald G., to Westinghouse Electric Corporation. Seismic motion-damper for upstanding electrical equipment. 3,973,078, Cl. 174-42.000.
Wolfson, Louis H.: *See—*
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Wolk, Ronald H.; Johnson, Axel R.; and Nongbri, Govanon, to Hydrocarbon Research, Inc. Production of low sulfur fuel oil and hydrogen from petroleum residium. 3,972,803, Cl. 208-97.000.
Wolvin, Arthur Dale; and Morris, Richard Milton, Jr., to Weyerhaeuser Company. Method of laminating planar and corrugated surface defining layers of sheet material. 3,972,763, Cl. 156-210.000.
Wonneberg, Heinz: *See—*
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Wood, Dennis E., to Rando Machine Corporation. Machine for forming fiber webs. 3,972,092, Cl. 19-156.300.
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Wright, Charles E. Bag closure. 3,972,469, Cl. 229-62.000.
Wright, John B.; and Hall, Charles M., to Upjohn Company, The. N,N'(Cyano-phenylene)dioxamic acids and esters. 3,972,911, Cl. 260-465.00D.
Wulf, Horst-Dieter; List, Ferdinand; Orlowski, Friedrich-August; Wilke, Norbert; and Pflegerl, Emmerich, to Chemische Werke Huls Aktiengesellschaft. Process for the esterification of terephthalic acid in the gas phase. 3,972,912, Cl. 260-475.00R.
Xerox Corporation: *See—*
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Yamagishi, Tomoo, to Nippon Gakki Seizo Kabushiki Kaisha. Ni-Fe-Al Material having high magnetic permeability. 3,972,745, Cl. 148-31.550.

Yamaguchi, Tomonobu: *See—*
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Yamashita, Mitsuo; Mikogami, Akio; Hasegawa, Masashi; and Oizumi, Hiroshi, to Denki Kagaku Kogyo Kabushiki Kaisha. Composition for diffusing phosphorus. 3,972,838, Cl. 252-518.000.

Yamashita, Nobuo, to Olympus Optical Co., Ltd. Retrofocus-type wide-angle photographic lens system. 3,972,594, Cl. 350-214.000.

Yamatsuta, Kohji: *See—*
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Yamazaki, Yasuhiro: *See—*
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Yano, Tsuyoshi; Take, Takao; Nakahara, Kentaro; and Sasano, Tetsuro, to Onoda Cement Company, Ltd. Process for producing a board of cement-like material reinforced by fibrous material and apparatus for the process. 3,972,972, Cl. 264-117.000.

Yardley, James Frank; and Wragg, Reginald Trevor, to Dunlop Limited. Method of making rubber and polyester structures. 3,972,973, Cl. 264-265.000.

Yasuda, Yasushi: *See—*
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Yatsunami, Kazuharu; Miyakado, Satoru; Shiohara, Katsuaki; Kataoka, Tsuneo; and Honda, Akira, to Nippon Kokan Kabushiki Kaisha. Method of feedig green pellets onto grate of pretreatment furnace in the production of reduced pellets. 3,972,411, Cl. 198-37.000.

Yatsuzuka, Yotaro: *See—*
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Yokote, Takamasa; and Kinouchi, Yoshitaka, to Toyo Aluminium K. K. Apparatus for detecting leakage from container and method therefor. 3,973,249, Cl. 340-242.000.

Yokozawa, Syunya: *See—*
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Yonkers, Edward H.; and Nagle, Floyd B., to Dow Chemical Company, The. Method and apparatus for testing articles employing a small arms primer. 3,972,222, Cl. 73-12.000.

Yoshida Kogyo Kabushiki Kaisha: *See—*
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Yoshikane, Toru; Kondo, Kunihiko; Otaki, Kazuya; Funabashi, Hiroyasu; Hasegawa, Toru; and Yamada, Ichiro, to Taiyu Doro Kensetsu Kabushiki Kaisha. Method for storing heated asphalt mixture. 3,972,154, Cl. 53-25.000.

Yoshimi, Toshikazu: *See—*
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Yoshimura, Hirofumi; Higuma, Toyonori; and Itoo, Noriaki, to Kabushiki Kaisha Yashica. Sound-recording motion-picture camera. 3,972,604, Cl. 352-14.000.

Yost, Arnold G., to Ohio Brass Company, The. Surge arrester of the multi-gap type. 3,973,172, Cl. 317-61.000.

Young, Patricia A.: *See—*
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Young, Thomas A.: *See—*
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Youtsey, Karl J.; Holt, William C., Jr.; Carnahan, Robert D.; and Spielberg, David H., to Universal Oil Products Company. Precision type resistor. 3,973,234, Cl. 338-226.000.

Yu, Ruey J., to General Motors Corporation. Temperature measuring circuit. 3,973,147, Cl. 307-310.000.

Yuasa, Mitsuo: *See—*
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Yuhos, John R.: *See—*
Carmien, Joseph Allen; and Yuhos, John R., 3,972,634.

Zabler, Erich, to Robert Bosch G.m.b.H. Inductive displacement sensor apparatus. 3,973,191, Cl. 324-34.00D.

Zabransky, Robert F., to Universal Oil Products Company. HF alkylation reaction temperature control system. 3,972,957, Cl. 260-683.480.

Zahradnik, George J.; Pudark, Arthur A.; and Turner, Carl L., to A. B. Dick Company. Guide chute arrangement for web feeding apparatus. 3,972,461, Cl. 226-89.000.

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Bell Telephone Laboratories, Inc.: *See*—
Earle, Harold W., and Robbins, T949,003.

Burnett, Glenna E.: *See*—
Coney, Charles H., and Burnett, T949,005.

Coney, Charles H., and G. E. Burnett. Coating solutions. T949,005, 8–3–76, Cl. 428—535.

Crane, Grant: *See*—
Fieldhouse, John W., Crane, and Kay. T949,009.

Crane, Grant, and E. L. Kay, to The Firestone Tire and Rubber Co. Rubber reclaiming process and product. T949,007, 8–3–76, Cl. 260—2.3.

Crane, Grant, and E. L. Kay, to The Firestone Tire and Rubber Co. Process of reclaiming scrap vulcanized rubber, and the soluble reclaimed rubber thus produced. T949,008, 8–3–76, Cl. 260—2.3.

Delaire, Gerard Y., and E. R. Hollander, Jr. Method and apparatus for molding poly(ethylene terephthalate) parisons. T949,004, 8–3–76, Cl. 264—328.

Dombroski, John R. Block-structured unsaturated copolyester compositions. T949,010, 8–3–76, Cl. 260—756.

Earle, Harold W., and J. Robbins, to Bell Telephone Laboratories, Inc. Electrical isolation circuit for connecting customer equipment to the telephone network. T949,003, 8–3–76, Cl. 179—16.

Fieldhouse, John W., G. Crane, and E. L. Kay, to The Firestone Tire and Rubber Co. Stabilization of elastomers and the elastomers thus stabilized. T949,009, 8–3–76, Cl. 260—2.3.

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Jaggard, James F. R., and I. G. Williams, to Imperial Chemical Industries, Ltd. Olefine polymerization process. T949,006, 8–3–76, Cl. 260—88.2.

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Haines, Richard F.; Fitzgerald, James W.; and Rositano, Salvadore A., to United States of America, National Aeronautics and Space Administration. Visual examination apparatus. Re. 28,921, Cl. 351-23.000.

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CLASS 10
7 3,972,083
10R 3,972,084

CLASS 11
1MB 3,972,085

CLASS 12
7.9 3,972,086
145 3,972,087

CLASS 13
31 3,973,075
35 3,973,076

CLASS 15
4 3,972,088
339 Re.28,920
345 3,972,089

CLASS 16
139 3,972,090

CLASS 19
156.3 3,972,092

CLASS 21
56 3,972,679
74R 3,972,678

CLASS 23
230R 3,972,680
253PC 3,972,682
253R 3,972,681
259 3,972,683
273SP 3,972,684
288FC 3,972,685
3,972,687
288K 3,972,688
288R 3,972,686
294R 3,972,689

CLASS 24
90B 3,972,093
150SP 3,972,094
205.11F 3,972,095

CLASS 28
4N 3,972,096

CLASS 29
33R 3,972,097
91.1 3,972,098
200P 3,972,099
203MW 3,972,101
203B 3,972,100
206D 3,972,102
263 3,972,103
280 3,972,104
283 3,972,105
401R 3,972,106
3,972,107
420.5 3,972,108
434 3,972,109
452 3,972,110
458 3,972,111
516 3,972,112
580 3,972,113

CLASS 30
41 3,972,114
59 3,972,115
228 3,972,116
287 3,972,117
296A 3,972,118
381 3,972,119

CLASS 32
22 3,972,120
27 3,972,121
40R 3,972,122
58 3,972,123

CLASS 33
134R 3,972,124
227 3,972,125

CLASS 34
3 3,972,126
4 3,972,127
32 3,972,128
3,972,129
45 3,972,130
60 3,972,131

CLASS 35
22R 3,972,132
26 3,972,133

CLASS 36
30R 3,972,135
101 3,972,136
118 3,972,134

CLASS 37
56 3,972,137

CLASS 40
2.2 3,972,138
28C 3,972,139
32 3,972,140
78 3,972,141

CLASS 42
69R 3,972,142
75A 3,972,143

CLASS 43
26 3,972,144
57 3,972,145

CLASS 47
58 3,972,146

CLASS 48
212 3,972,690

CLASS 49
41 3,972,147

CLASS 51
5D 3,972,148
8R 3,972,149
11 3,972,150
50PC 3,972,151
141 3,972,152
206R 3,972,161

CLASS 52
69 3,972,162
82 3,972,163
95 3,972,164
309 3,972,165
404 3,972,166
481 3,972,167
698 3,972,168
702 3,972,169
750 3,972,170

CLASS 53
22A 3,972,153
25 3,972,154
30R 3,972,155
384 3,972,157

CLASS 55
23 3,972,691
3,972,692
42 3,972,693
97 3,972,694
146 3,972,701
158 3,972,695
222 3,972,696
242 3,972,697
261 3,972,698
283 3,972,699
385B 3,972,700

CLASS 56
10.2 3,972,156
13.6 3,972,158
192 3,972,159
255 3,972,160

CLASS 57
58.89 3,972,171
3,972,172
3,972,173
140J 3,972,174
145 3,972,175
157TS 3,972,176

CLASS 58
63 3,972,177
85.5 3,972,178
3,972,179

CLASS 60
39.05 3,972,180
39.66 3,972,181
39.74R 3,972,182
288 3,972,184
421 3,972,185
425 3,972,186
428 3,972,187
443 3,972,188
444 3,972,189
551 3,972,190
553 3,972,191
562 3,972,192
641 3,972,183
646 3,972,193
650 3,972,194
671 3,972,195
677 3,972,196

CLASS 61
1F 3,972,197
84 3,972,200
98 3,972,198
103 3,972,199
108 Re.28,922

CLASS 62
54 3,972,201
55 3,972,202
402 3,972,203
447 3,972,204

CLASS 64
19 3,972,205

CLASS 65
1 3,972,702
11W 3,972,703
157 3,972,704

CLASS 66
50R 3,972,206
3,972,207
3,972,208

CLASS 68
22R 3,972,209

CLASS 70
366 3,972,210

CLASS 71
78 3,972,705
90 3,972,706
94 3,972,707

CLASS 72
14 3,972,211
102 3,972,212
104 3,972,213
132 3,972,214
326 3,972,215
337 3,972,216
344 3,972,217
407 3,972,218
416 3,972,219

CLASS 73
7 3,972,220
3,972,221
12 3,972,222
3,972,223
28 3,972,225
3,972,226
67.7 3,972,227
3,972,228
85 3,972,229
114 3,972,224
116 3,972,230
170A 3,972,231
194VS 3,972,232
231R 3,972,233
303 3,972,234
311 3,972,235
362AR 3,972,236
3,972,237
380 3,972,238
431 3,972,239

CLASS 74
10.41 3,972,240
10.54 3,972,241
30 3,972,242
200 3,972,243
217B 3,972,244
243R 3,972,245
360 3,972,246
489 3,972,247
498 3,972,248
526 3,972,249

CLASS 75
60 3,972,708
93R 3,972,709
101R 3,972,710
117 3,972,711
157.5 3,972,712
171 3,972,713

CLASS 81
57.29 3,972,252
91C 3,972,253

CLASS 82
5 3,972,250
14R 3,972,251

CLASS 83
4 3,972,254
3,972,255
155 3,972,256
198 3,972,257
549 3,972,260

CLASS 84
1.03 3,972,258
1.24 3,972,259

CLASS 89
1.813 3,972,261

CLASS 90
19 3,972,262

CLASS 91
6 3,972,263
358A 3,972,264
404 3,972,265
417R 3,972,266
445 3,972,267
492 3,972,268

CLASS 92
84 3,972,269

CLASS 93
58R 3,972,270
58.2R 3,972,271

CLASS 96
1TE 3,972,714
1R 3,972,715
1.2 3,972,716
1.5 3,972,717
3,972,718
66.3 3,972,719

CLASS 98
50 3,972,272

CLASS 99
300 3,972,273
323.4 3,972,274
326 3,972,275
443R 3,972,276
451 3,972,277
3,972,278
516 3,972,279

CLASS 101
93.16 3,972,280
110 3,972,281
111 3,972,282
226 3,972,283
327 3,972,284

CLASS 102
22 3,972,285
38 3,972,286
39 3,972,287
70R 3,972,288
3,972,289
79 3,972,290
87 3,972,291

CLASS 104
2 3,972,292
130 3,972,293

CLASS 106
40V 3,972,721
54 3,972,720
57 3,972,722
90 3,972,723
103 3,972,724

CLASS 111
3 3,972,294

CLASS 112
79A 3,972,295
121.27 3,972,296
219A 3,972,297
254 3,972,298

CLASS 113
7R 3,972,299

CLASS 114
39 3,972,300
162 3,972,301

CLASS 116
28R 3,972,302

CLASS 118
3 3,972,303
44 3,972,304
637 3,972,305
3,972,306

CLASS 119
20 3,972,307
60 3,972,308
159 3,972,309

CLASS 123
117R 3,972,310
119A 3,972,312
119F 3,972,311
122AC 3,972,324
122A 3,972,313
139AW 3,972,314
148E 3,972,315

CLASS 126
270 3,972,316
271 3,972,317
348 3,972,318

CLASS 127
58 3,972,725

CLASS 128
1C 3,972,319
2.06E 3,972,329
2.1A 3,972,320
57 3,972,322
91R 3,972,323
132R 3,972,325
145.8 3,972,327
156 3,972,328
210 3,972,326
220 3,972,330
232 3,972,331
303R 3,972,332
318 3,972,333
348 3,972,321
419PG 3,972,334

CLASS 131
267 3,972,335

CLASS 132
7 3,972,336
45R 3,972,337

CLASS 133
4A 3,972,338

CLASS 134
168R 3,972,339

CLASS 136
20 3,972,726
30 3,972,727
43 3,972,728
75 3,972,729
86A 3,972,730
86D 3,972,732
86R 3,972,731
89 3,972,733
90 3,972,734
122 3,972,735
163 3,972,736
166 3,972,737
174 3,972,738
181 3,972,739
239 3,972,740

CLASS 137
38 3,972,340
102 3,972,341
110 3,972,342
112 3,972,343
119 3,972,344
485 3,972,364
490 3,972,345
505.42 3,972,346
596.18 3,972,347
601 3,972,348
609 3,972,349
624.18 3,972,350
625.47 3,972,351

CLASS 138
42 3,972,352
3,972,353
103 3,972,354

CLASS 139
449 3,972,355

CLASS 140
147 3,972,356

CLASS 144
3D 3,972,357
3R 3,972,358

CLASS 148
1.5 3,972,741
3,972,742
11.5R 3,972,743
12.4 3,972,744
31.55 3,972,745
32 3,972,746
3,972,747
3,972,748
33 3,972,749
149 3,972,751
162 3,972,752
171 3,972,750
3,972,753
175 3,972,754

CLASS 151
22 3,972,359
3,972,360
3,972,361

CLASS 156
3 3,972,755
17 3,972,756
73.1 3,972,758
143 3,972,757
167 3,972,759
181 3,972,760
187 3,972,761
196 3,972,762
210 3,972,763
243 3,972,764
315 3,972,765
358 3,972,766
397 3,972,767
545 3,972,768
577 3,972,769
600 3,972,770

CLASS 157
1.26 3,972,363
13 3,972,362

CLASS 160
183 3,972,365

CLASS 162
343 3,972,771

CLASS 164
52 3,972,366
72 3,972,367
76 3,972,368
147 3,972,369

CLASS 165
163 3,972,370
178 3,972,371

CLASS 166
248 3,972,372

CLASS 169
62 3,972,373

CLASS 170
50 3,972,091

CLASS 172
261 3,972,374

CLASS 173
50 3,972,375
139 3,972,376
CLASS 174
15BH 3,973,077
42 3,973,078
CLASS 176
37 3,972,772
CLASS 177
117 3,972,377
CLASS 178
6 3,973,079
6.6R 3,973,080
CLASS 179
15A 3,973,081
81R 3,973,082
90D 3,973,083
90K 3,973,084
99 3,973,085
170NC 3,973,088
3,973,089
170R 3,973,087
170.2 3,973,086
175.3A 3,973,090
CLASS 180
6.5B 3,972,378
46 3,972,379
65R 3,972,380
79.1 3,972,381
98 3,972,382
CLASS 181
33HC 3,972,383
36C 3,972,384
192 3,972,385
CLASS 182
50 3,972,386
CLASS 184
28 3,972,387
CLASS 187
9E 3,972,388
29R 3,972,389
CLASS 188
1A 3,972,391
1C 3,972,390
43 3,972,392
73.1 3,972,394
73.3 3,972,393
251A 3,972,395
312 3,972,396
CLASS 192
3.3 3,972,397
4A 3,972,398
58B 3,972,399
107R 3,972,400
109F 3,972,401
CLASS 193
35A 3,972,402
CLASS 195
29 3,972,773
3,972,774
33 3,972,775
65 3,972,776
66R 3,972,777
139 3,972,778
CLASS 196
14.5 3,972,779
CLASS 197
19 3,972,403
71 3,972,404
CLASS 198
9 3,972,405
3,972,406
20R 3,972,407
29 3,972,408
31AC 3,972,409
3,972,410
37 3,972,411
138 3,972,412
180 3,972,413
202 3,972,414
205 3,972,415
CLASS 200
5A 3,973,091
61.47 3,973,092
61.58B 3,973,093
61.93 3,973,095
67PK 3,973,094
144B 3,973,096
153L 3,973,097
159R 3,973,099
CLASS 201
39 3,972,780
CLASS 202
241 3,972,781
263 3,972,782
CLASS 204
1T 3,972,783
14N 3,972,784
32R 3,972,786
47 3,972,787
55R 3,972,788
55Y 3,972,789
117 3,972,790
180P 3,972,791
195R 3,972,792
219 3,972,793
266 3,972,794
269 3,972,795
3,972,796
290R 3,972,797
297W 3,972,785
3,972,798
300R 3,972,799
302 3,972,800
CLASS 206
63.3 3,972,418
106 3,972,416
354 3,972,417
CLASS 208
11R 3,972,801
33 3,972,802
97 3,972,803
108 3,972,804
139 3,972,805
3,972,806
309 3,972,807
CLASS 209
133 3,972,808
CLASS 210
24 3,972,809
33 3,972,810
71 3,972,811
77 3,972,812
79 3,972,813
84 3,972,814
219 3,972,815
259 3,972,816
325 3,972,817
435 3,972,818
513 3,972,819
CLASS 211
78 3,972,419
CLASS 212
14 3,972,420
CLASS 213
127 3,972,421
CLASS 214
1BB 3,972,422
1BT 3,972,423
1Q 3,972,424
10.5R 3,972,425
3,972,439
35R 3,972,426
38BA 3,972,427
85 3,972,428
130R 3,972,429
147G 3,972,430
3,972,431
340 3,972,432
450 3,972,433
730 3,972,434
CLASS 215
12R 3,972,435
220 3,972,436
CLASS 219
10.49 3,973,105
69G 3,973,104
153 3,973,098
216 3,973,106
222 3,973,100
368 3,973,101
523 3,973,102
543 3,973,103
CLASS 220
1.5 3,972,437
4R 3,972,438
18 3,972,440
21 3,972,441
89A 3,972,442
90.4 3,972,443
222 3,972,444
268 3,972,445
CLASS 222
3 3,972,446
5 3,972,447
14 3,972,448
64 3,972,449
91 3,972,450
485 3,972,451
501 3,972,452
530 3,972,453
541 3,972,454
CLASS 223
96 3,972,455
CLASS 224
42.03B 3,972,456
42.42R 3,972,457
CLASS 225
20 3,972,458
47 3,972,459
CLASS 226
6 3,972,460
89 3,972,461
CLASS 227
111 3,972,462
CLASS 228
44.1A 3,972,463
112 3,972,464
3,972,465
216 3,972,466
CLASS 229
14BL 3,972,467
51BP 3,972,468
62 3,972,469
CLASS 235
61.11E 3,973,107
61.7B 3,973,237
92PC 3,973,108
151.21 3,972,470
151.33 3,973,109
152 3,973,110
156 3,973,111
3,973,112
3,973,113
CLASS 236
46R 3,972,471
87 3,972,472
CLASS 239
34 3,972,473
102 3,972,474
127.3 3,972,475
167 3,972,476
183 3,972,477
189 3,972,478
265.11 3,972,479
CLASS 240
7.1LJ 3,973,114
41.35C 3,973,115
78F 3,973,116
CLASS 241
15 3,972,480
30 3,972,481
3,972,482
46.11 3,972,483
154 3,972,484
CLASS 242
55.19A 3,972,485
66 3,972,486
68.7 3,972,487
72B 3,972,488
128 3,972,489
CLASS 244
12B 3,972,490
17.27 3,972,491
30 3,972,492
115 3,972,493
130 3,972,494
145 3,972,495
155R 3,972,496
CLASS 246
428 3,972,497
CLASS 248
205R 3,972,498
224 3,972,499
485 3,972,500
CLASS 249
42 3,972,501
198 3,972,502
CLASS 250
199 3,973,117
226 3,973,118
231R 3,973,119
272 3,973,120
292 3,973,121
334 3,973,124
338 3,973,122
343 3,973,123
443 3,973,125
444 3,973,126
445T 3,973,127
3,973,128
461B 3,973,129
476 3,973,130
502 3,973,131
531 3,973,132
532 3,973,133
574 3,973,134
CLASS 251
30 3,972,503
82 3,972,504
129 3,972,505
133 3,972,506
172 3,972,507
CLASS 252
5 3,972,820
45 3,972,853
75 3,972,821
78.1 3,972,822
132 3,972,823
364 3,972,824
382 3,972,825
408 3,972,826
3,972,827
430 3,972,828
3,972,829
3,972,830
432 3,972,831
437 3,972,832
453 3,972,833
455R 3,972,834
455Z 3,972,835
471 3,972,836
473 3,972,837
518 3,972,838
548 3,972,839
CLASS 254
29A 3,972,508
93H 3,972,509
CLASS 256
11 3,972,510
47 3,972,511
CLASS 259
102 3,972,512
CLASS 260
2P 3,972,841
2.1R 3,972,840
2.3 3,972,842
2.5B 3,972,843
16 3,972,844
19UA 3,972,845
23H 3,972,854
30.4N 3,972,846
30.6R 3,972,847
32.8A 3,972,848
37SB 3,972,850
37P 3,972,849
47ET 3,972,851
47C 3,972,852
77.5AP 3,972,856
79.5C 3,972,857
112R 3,972,858
112.5LH 3,972,859
112.5R 3,972,860
123.5 3,972,861
239.1 3,972,869
3,972,870
3,972,872
239.3B 3,972,873
239.57 3,972,871
240G 3,972,874
3,972,875
3,972,876
3,972,878
240R 3,972,877
244R 3,972,879
247.1P 3,972,880
249 3,972,881
249.5 3,972,882
285.5 3,972,883
287AZ 3,972,884
289GP 3,972,885
294.8F 3,972,886
294.8K 3,972,887
297Z 3,972,888
304R 3,972,890
308R 3,972,891
3,972,892
314.5 3,972,893
325R 3,972,894
329S 3,972,895
340.5 3,972,896
3,972,897
340.9 3,972,898
343.5 3,972,899
346.2R 3,972,900
346.3 3,972,901
3,972,902
346.8R 3,972,903
372 3,972,904
396N 3,972,905
397.45 3,972,906
410.9R 3,972,907
429.7 3,972,908
453PH 3,972,910
453R 3,972,909
465D 3,972,911
475R 3,972,912
488CD 3,972,913
496 3,972,914
502.5 3,972,915
514D 3,972,917
514G 3,972,916
519 3,972,918
3,972,919
531R 3,972,920
534C 3,972,921
535P 3,972,922
543P 3,972,923
3,972,924
544V 3,972,925
556F 3,972,926
559R 3,972,927
561P 3,972,928
563P 3,972,929
563R 3,972,930
564R 3,972,931
565 3,972,932
566R 3,972,933
567.6M 3,972,855
570R 3,972,935
570.8TC 3,972,936
570.8R 3,972,934
571 3,972,937
583K 3,972,938
3,972,940
583P 3,972,939
593R 3,972,941
3,972,942
594 3,972,943
599 3,972,944
600R 3,972,945
604AC 3,972,946
614R 3,972,947
615R 3,972,948
3,972,949
619A 3,972,950
620 3,972,951
642R 3,972,952
651R 3,972,953
680E 3,972,954
681 3,972,955
683.48 3,972,956
3,972,957
683.49 3,972,958
841 3,972,959
857PE 3,972,960
857G 3,972,961
873 3,972,962
880B 3,972,963
897A 3,972,964
CLASS 261
91 3,972,965
114R 3,972,966
CLASS 264
3R 3,972,967
29.2 3,972,968
42 3,972,969
45.9 3,972,970
115 3,972,971
117 3,972,972
265 3,972,973
267 3,972,974
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56 : 3,972,107

DESIGN PATENTS

4 : 240,775	240,869	240,796	240,819	240,810	240,829
240,793	8 : 240,826	240,799	240,832	240,815	240,831
240,841	9 : 240,791	240,821	240,834	240,816	42 : 240,772
6 : 240,794	240,800	22 : 240,851	240,845	240,820	240,837
240,795	240,862	25 : 240,849	240,853	240,827	44 : 240,784
240,802	10 : 240,787	240,868	240,859	240,838	46 : 240,807
240,804	11 : 240,818	26 : 240,805	36 : 240,770	240,839	48 : 240,850
240,812	12 : 240,777	240,806	240,771	240,844	240,865
240,825	240,814	240,855	240,778	240,861	240,866
240,830	240,824	27 : 240,843	240,779	240,863	51 : 240,842
240,840	240,835	240,848	240,782	240,864	53 : 240,822
240,847	13 : 240,776	29 : 240,798	240,797	37 : 240,786	240,823
240,860	240,836	240,833	240,803	39 : 240,808	240,854
240,867	17 : 240,789	34 : 240,774	240,809	240,828	55 : 240,801

PLANT PATENTS

6 : 3,938					

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

34 : T949,003	39 : T949,007	47 : T949,009	T949,004	T949,005	T949,010
36 : T949,002	T949,008	T949,001			

U. S. GOVERNMENT PRINTING OFFICE : O - 1976

U.S. DEPARTMENT OF COMMERCE

Elliot L. Richardson, Secretary

PATENT AND TRADEMARK OFFICE

C. Marshall Dann, *Commissioner*